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. . . . . See page 16 for the st article of the new series on Materials Handling.

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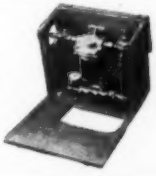

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EDITORIAL

Are Safety Awards Unfair? ... 8

★ ★ ★

Safety Is Not Window Dressing ... by J. E. TRAINER 15
35 Rules for Power Trucks (material handling series) ... 16

★ ★ ★

How to Select First Aid Equipment for the Small Plant (first aid series) by CARL J. POTTHOFF & EARL BREON 18
Does Anyone Read Safety Posters? ... by HARRY HOPKINSON 20
SAFETY ENGINEERING'S Poster for February ... opposite page 20

★ ★ ★

How to Prevent Laboratory Accidents (safe handling of chemicals series) ... 22
Personnel Problem Discussions Help Safety ... 26

★ ★ ★

Transportation Safety ... 30
The Future Shows ... 54

★ ★ ★

Industrial Hygiene ... 56
Learning the Hard Way ... 58
The Industrial Nurse ... 64

★ ★ ★

Free Bulletins & Catalogs ... 67
New Products in the Safety Field ... 68
Index to Advertisers ... 72

★

PICTURE CREDITS

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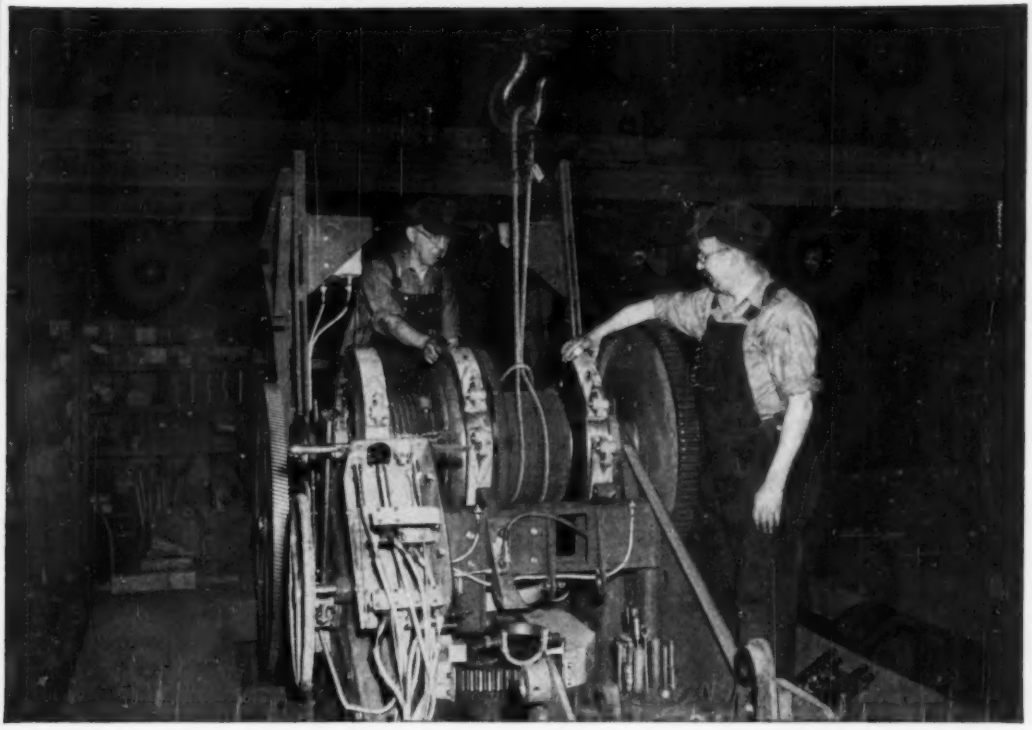

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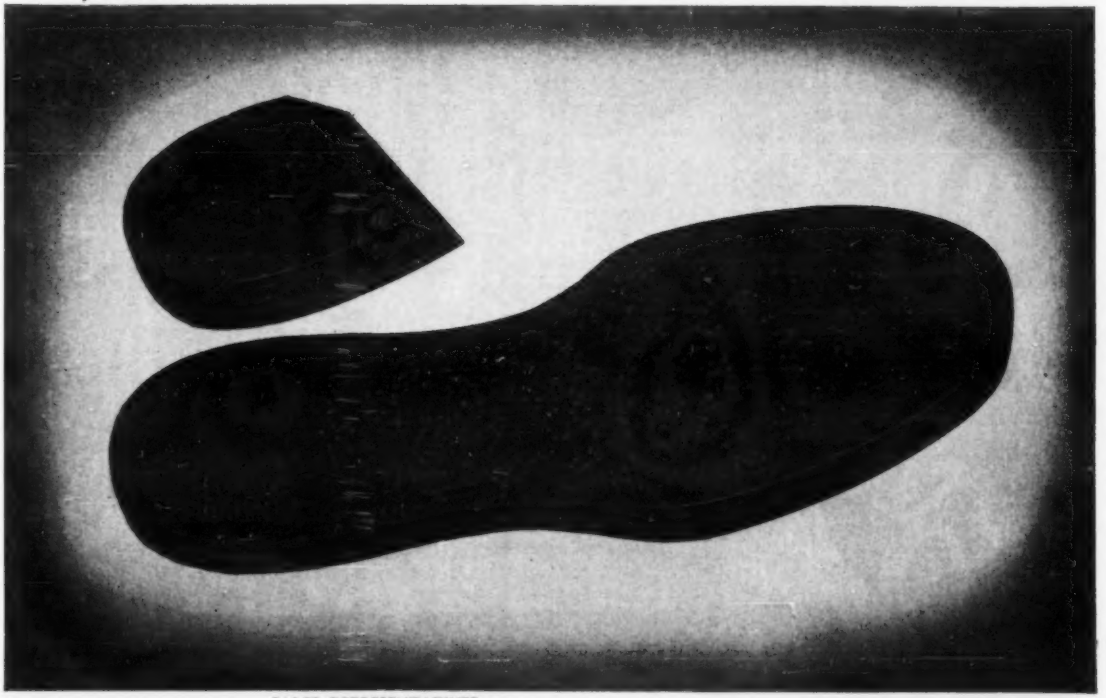

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It's Safe to Say

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★ ARE SAFETY AWARDS UNFAIR?

YEARS ago there arose the practice of giving various awards in recognition of outstanding achievements in the field of accident prevention effort. The plan was predicated on the belief that we all respond to the appeal of competition and through the years we have had convincing proof of this procedure.

Safety awards have taken the form of watches, knives, plaques, trophies and certificates most of which can be dramatized in a photograph suitable for publicity purposes. The photograph usually shows the donor, the recipient, a representative of high brass, all slightly self-conscious, and of course the actual award which is either framed, placed on a pedestal or put away in a drawer.

What of the man who actually contributes so much to earning the award? Unfortunately, he is all too often overlooked during the festivities or at most is merely a part of the audience. By now it is almost common practice to give a safety emblem or lapel button to bus drivers and truck operators who have covered a given mileage or who may have driven a number of years without accident and no one can quarrel with that form of recognition and safety-mindedness. In fact, in some states a movement has started to award drivers of passenger cars with some tangible award for safe driving—a worthy effort indeed.

An inequitable situation arises however in a typical instance where Joe Doakes is given an award for driving a truck "x" number of years without accident. When his safety record spans the longer period of "2x" years, good old Joe is called in to receive further approbation, which is as it should be. On the other hand, his brother Bill Doakes is busy operating a punch press or pouring metal in a foundry and may have worked five times as long without accident. Usually, Bill's safety record is taken for granted and all he receives is a severe reprimand if he stubs his toe.

Happily, some of the more progressive plants as well as their insurance carriers now recognize the value of the badge of honor for all safe workers, regardless of their duties, and small safety emblems and buttons are being distributed to plant personnel as well as motor vehicle drivers. Often, the plant employee will be exposed to hazards every bit as severe as his horn-tooting brothers, and it would seem only fair to acknowledge and encourage the safe practices of all the staff. Investment in a "safe worker's" emblem or button is small indeed in relation to the dividends that can accrue in the form of greater emphasis upon safety, constant use of protective devices and equipment with resultant time and money saved, to say nothing of prevention of human suffering. The man in the plant will be just as proud and just as quick to show off his safety emblem as will Joe sitting high in the driver's seat of a truck cab.

It's about time that we take steps to end a situation which is sufficiently unfair to affect the morale of all the working personnel. H.A.

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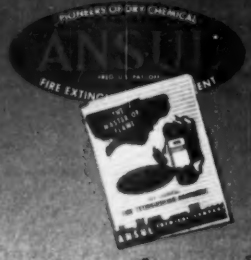

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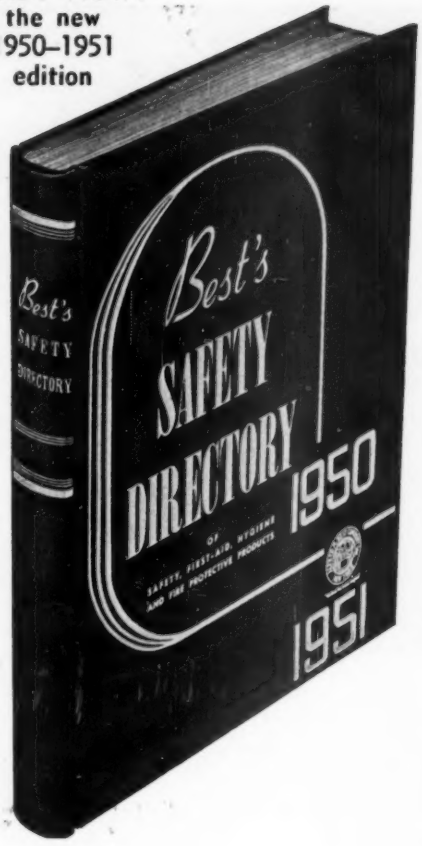

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. . . . .

Those old Chinese spectacles were really GOGGLES, because they were made of plain crystal and simply shielded the eyes. So the wise old Chinese were the first to say "Wear Your Goggles."

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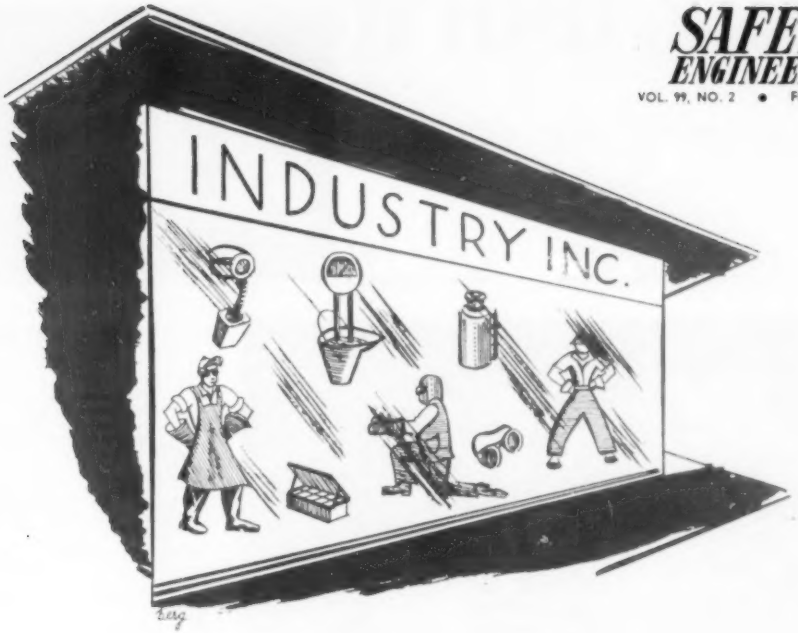


"Safety" is NOT window dressing

By J. E. TRAINER,
Vice-President in Charge of Production, The Firestone Tire & Rubber Company *
Akron, Ohio

Safety is not window dressing and workers are not expendable. On the contrary, accident prevention is vital not only for financial and humanitarian reasons but also for the eight ways it helps production.

IN THIS world of ours where technical engineering has far outstripped human engineering, we need more of the type of work being done by safety engineers. The lag in human engineering behind technological engineering is tremendous, and in the minds of many, this lag contains the dynamite that could result in the destruction of civilization. Today we have the greatest moral responsibility of all times—responsibility of protecting the peoples of the earth from violent death or injury whether from industrial accidents, or from atomic wars. We must not shirk that responsibility.

Although this article is going to discuss for the most part safety engineering's contribution to production from a financial standpoint, it should be stressed that safety engineering's greatest contribution is the prevention of suffering. Any person with a regard for human life and well-being cannot fail to be interested deeply in accident prevention. Industry is obligated to society to prevent accidents and suffering when it is at all possible to do so. Here in America we will never tolerate lightly any working conditions which are likely to lead to the death or crippling of an individual. Accidents involving death or permanent disability of a worker in most cases result in broken homes and shrunken opportunities for the children therein.

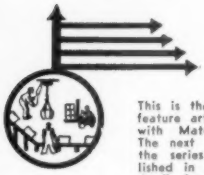
We have come far from the time when employees were considered expendable. Some years ago, certain rule-of-thumb statistics were the basis of approach to the accident problems of *(To page 38)*

* The Firestone Tire & Rubber Co. has received the National Safety Council's Distinguished Service to Safety Award for four consecutive years on a company-wide basis.

Trucks should be driven over bridge plates slowly and with care.

Operators must exercise extreme caution during high tiering.

FEATURE



This is the first of three feature articles concerned with Material Handling. The next two articles of the series will be published in the March and April issues of SAFETY ENGINEERING.

THE development of various types of power trucks to handle and transport materials has been one of the noteworthy and characteristic features of modern industry. This substitution of the mechanical for the manual has speeded the flow of goods within the plant, increased production, hastened delivery of finished products and freed employees from the sprains, strains and wounds associated with manual handling.

In spite of these advantages, however, industrial power trucks have created new hazards. Our public highways have their daily quota of disasters. In much the same way, although less gruesomely, industrial

Trucks and tractors should cross railroad tracks at an angle.

35 RULES FOR POWER TRUCKS

and safety pointers for their general operation

Industrial power trucks are no safer than the way they are maintained and operated. The suggestions made in this article are based on the new tentative "Safety Code for Industrial Power Trucks" which is sponsored by the American Society of Mechanical Engineers for the American Standards Association.

power trucks have been involved in accidents caused by lack of operating judgment, improper repair or maintenance, thoughtless loading, incompetence, and lack of common sense. Indeed, the very fact that some types of trucks are able to handle materials vertically as well as horizontally has added to the skill required of the operator.

To make industrial trucks a safe tool as well as an efficient tool of production, the American Society of Mechanical Engineers has drawn up a tentative "Safety Code for Industrial Power Trucks." This code incorporates the recommendations of users, manufacturers and others concerned with industrial power trucks and accident prevention. It has been presented to the American Standards Association for approval as another in their valuable series of American Safety Standards. Copies of the complete tentative code are available from the American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y. at a cost of 85c per copy, with quantity discounts up to 50%.

The code itself is divided into three parts. Part I deals with the construction and design features of industrial power trucks, with emphasis on various types of guards and guarding devices to prevent accidents and on the use of this mechanized equipment in hazardous locations. Parts II and III deal respectively with general safety regulations and with specific safety rules and regulations. "SAFETY ENGINEERING" believes that this code should be made known to every plant in the country using power trucks. The remainder of this article, by permission of the American Society of Mechanical Engineers, is based on Parts II and III of the tentative code.

GENERAL SAFETY REGULATIONS

The following rules and regulations apply to all types of material handling equipment, commonly known as industrial power trucks of both the driver-ride and the powered hand-type, including those powered by gasoline engines, gas-engine generating equipment, or storage battery. They apply also irrespective of whether the trucks are of the self-loading elevating type, or of the flat-bed-platform burden-carrier type.

Truck Operators

Qualifications. No operator shall operate or drive an industrial power truck unless physically qualified by an examining physician. Visual acuity (either without glasses or by correction with glasses) shall be at least 20/40 in one eye, and 20/100 in the other eye; form field shall be not less than 45 deg. in all meridians from the point of fixation; ability to distinguish red, green, and yellow shall also be required.

Training. Only trained operators shall be permitted to operate an industrial power truck. Methods shall be devised to train operators in the safe operation of industrial power trucks as described below.

Authorized Operations. Industrial power trucks shall be operated only by authorized operators.

General Operation & Maintenance

Gasoline Handling and Storage. Gasoline shall be handled and stored in accordance with the provisions as outlined and referred to in Chapter V, Secs. 80, 81, and 82 of the Suggested Ordinance covering the "Use, Handling, and Storage of Flammable Liquids," 1946 edition, published separately by the National Fire Protection Association and in the National Fire Codes, Vol. 1, "Flammable Liquids."

In addition to the provisions of the above-mentioned code the following precautions shall be observed:

a. Industrial power trucks shall be refueled only at locations specially designated for that purpose. Locations outside main buildings should be selected to minimize the damage to property and equipment in the event of a fire. (For refueling locations inside buildings see National Fire Codes, Volume 1, Section 29.)

b. Engines shall be stopped before refueling.

c. Reasonable care shall be exercised to avoid spilling gasoline or overflowing the gasoline tank during refueling operations. (Note: Any loose fuel should be flushed or blown away from the engine or allowed sufficient time to vaporize and dissipate itself *(To page 47)*

This 24-unit first aid kit is used by the American Red Cross for highway first aid stations, mobile first aid units, emergency medical stations, and for instruction purposes.

HOW TO SELECT FIRST AID EQUIPMENT FOR THE SMALL PLANT

By CARL J. POTTHOFF,
National Director of First Aid & Associate Medical Director,
and EARL BREON,
Assistant Director of First Aid,
The American National Red Cross, Washington, D.C.

THE variety of items needed in a first aid kit or cabinet depends to a great extent upon the type of plant or factory where it is to be used, the amount of first aid training given to plant employees, and the type of medical services available. If the plant is large enough to employ regular medical services (physician and nurses), the selection of first aid equipment should be the direct responsibility of that department. For example, the use of splints, burn ointments and antiseptics by plant employees might be contrary to the wishes of the medical department and would not be stocked as regular first aid items. On the other hand, small plants where medical services are not readily available might wish to stock these items in quantity.

In certain industries, such as public utilities and communications, where workmen are used extensively outside the plant as well as inside and where the use of trucks and other vehicles are part of the job, 24-unit first aid kits and other first aid supplies, such as splints and blankets, should be part of the vehicles' regular equipment and available for immediate use.

The full value of first aid kits and cabinets in industrial concerns cannot be realized until the employees are trained to a certain extent in the proper use of the equipment. When an accident occurs to a worker others in the immediate vicinity react spontaneously and try to help. Lack of training and improper use of first aid items can be disastrous in many cases.

Since it has already been pointed out that an industrial concern having adequate medical services avail-

What factors should decide the amount of first aid equipment needed?
What are the minimum items for a plant of about 100 people?
What first aid items should be provided for workers assigned to motor vehicles?

able will be guided by that department in selecting the type and quantity of first aid items, let us consider the small plant where these services are not readily available.

Minimum items of equipment for a plant employing approximately 100 people. Individual items may be bought separately or commercial kits may be ordered. Commercial kits should be carefully examined before purchase to make sure that they contain the proper quantities of the items needed.

Sterile Dressings

Only three sizes of dressings are really needed: the 1" adhesive dressing for small cuts or scratches, the 4" x 4" gauze dressing for wounds of moderate size, and the ½ square yard plain absorbent gauze compress for large wounds.

1" adhesive dressings can be purchased in cartons or cans of 100 per container. Two containers should be sufficient and three would be liberal for a plant of 100 employees, providing that the dressings are used only for injuries occurring in the plant.

The 4" x 4" dressing is the size most often used in hospital emergency rooms. These dressings are individually wrapped and sterilized and cost only a few cents each. The dressing may be applied with adhesive tape, roller bandage or triangular bandage.

The ½ square yard plain absorbent gauze compress can be obtained in packets usually containing two dressings per packet. A dozen dressings (six packets) will ordinarily be sufficient.

Bandages

Adhesive tape and triangular bandages are sufficient to meet the bandage needs of the small plant first aid kit. Roller bandages are not included because unless applied by an expert they are likely to impede circulation if they are wrapped firmly enough to stay in place. However, such bandages may be included if finger injuries are common.

Three rolls of 2" adhesive tape or a large roll of adhesive of assorted widths should be ample.

Eight triangular bandages should be included in the first aid equipment since this number may be needed to handle a single femur fracture. These bandages can readily be made from 40" or 42" unbleached muslin or similar material and need not be sterilized. In addition, there should be at least two sterile packaged triangular bandages. These will serve well in case of a very severe wound or an extensive burn.

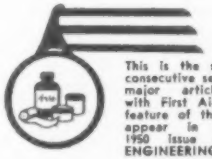
Tourniquet

A tourniquet about 2" in width and made of soft material should be included. One of the triangular bandages folded to a cravat form will serve. A stout stick should be available to tighten the band.

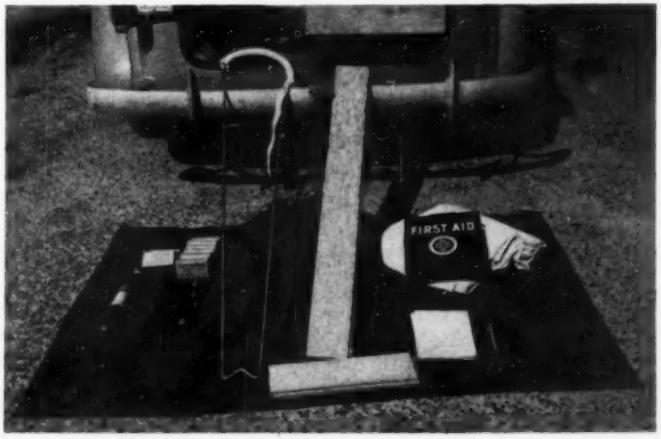
Antiseptic

There are many good antiseptics on the market. A plant can readily get advice on the choice of antiseptics from the local medical society or a local doctor who is on call by the plant. If a wound is serious and will be seen soon by a physician, the employee may be instructed not to apply an antiseptic but merely apply a sterile dressing. If an antiseptic is used, it is better to have it in small vials rather than in a large bottle, thereby diminishing the problem of evaporation. Some commercial vials are *(To page 45)*

FEATURE



This is the second of a consecutive series of three major articles dealing with First Aid. The next feature of the series will appear in the March 1950 issue of SAFETY ENGINEERING.



Additional first aid equipment recommended for motor vehicles includes fire extinguisher, flare, flashlight, extra triangular bandages, half-ring splint, wood splints, a blanket, notebook and pencil.

Does Anyone Read Safety Posters?

By HARRY HOPKINSON *

AFTER taking safety posters and bulletins very much for granted for fifteen years I finally decided to conduct a poll to find out for myself whether people actually read them, and if so, whether they derived any benefit therefrom.

Over a period of several months employees in three different types of plants (a salt mine, a garment manufacturer and a drop hammer shop) were interviewed. These plants not only varied widely in operations, but also in their safety record and activities, one being average, one excellent and one poor. While the total employment in these three businesses exceeded fifteen hundred people, less than one-third were interviewed.

The type of boards used in the three plants were basically the same, consisting of a simple board, sometimes glass covered, illuminated, and of a size that would accommodate several standard size bulletins, plus a couple of plant notices. No outdoor boards, or "spectaculars" were involved.

The following four questions were asked of each employee who was interviewed:

1. Where is the nearest bulletin board?

2. Describe or identify a current bulletin.

3. Do you read them regularly?

4. Do you think they help you avoid accidents?

While this may not have been a scientific poll, less attention was paid to this fact than perhaps would have been paid prior to the last presidential election. And, after all, the survey was undertaken primarily for my own edification.

The results were somewhat surprising to me, both as to the answers to the questions, and to the many excellent suggestions made by various employees in regard to rearrangement of the bulletin boards, relocation of boards, suggested spots for new boards and other items pertaining directly or indirectly to the subject.

Ninety percent of all those questioned knew the location of the bulletin board nearest to their normal place of work. In order to be credited with an affirmative answer, they had to describe accurately the location. Of the ten percent who did not know the location a few were comparatively new people who had not as yet had a chance to familiarize themselves with their surroundings.

The second question, of course, was by far the hardest, but forty percent of those interviewed could actually satisfactorily describe one or more of the bulletins posted at the time of the interview. The bulletins in question had been up anywhere from several days to three weeks. This is probably more indicative of the actual results of posting bulletins than the answers to the other questions, and I personnally feel that forty percent is a pretty good average.

The third question was interpreted to mean that a regular reader is one who looks at the bulletin board three or four times a week, and eighty-one percent of those interviewed professed to fall in this category. This certainly indicates that bulletins should be changed a lot more frequently than once a month, probably twice a week being a reasonable figure for a plant with a somewhat limited source of bulletins. As may be seen from the foregoing question there is certainly no reason why bulletins should not be used a second and third time provided several months elapsed time is used between postings.

Ninety-three percent of those interviewed stated that they felt that bulletins in general helped them at one time or another to avoid accidents but were more inclined to think that this was due to the fact that bulletins reminded them of safety rather than to any specific text or occupational item in a specific bulletin. I view the results of

* The author is Safety Engineer for a leading insurance organization.

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YOU COULD LIFT MANY TIMES YOUR OWN WEIGHT
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AVOID RUPTURE

this particular question with some suspicion, as I think in quite a few cases they probably answered in the affirmative because they felt that that was what I, as a safety engineer, would like to have them say. However, there is no positive way of determining this, and the reader is entitled to form his own conclusions.

The survey produced a few amusing incidents, such as the worker who had no idea of what a safety bulletin was until it was graphically described to him (with the use of both hands and shoulders). After twenty seconds of this, his eyes lit up and he said, "Oh! yes, I have one of them." At this point I thought it best to terminate the conversation, something I have since regretted, for I still wonder occasionally just what he thought we were talking about.

While the over-all results of the survey proved nothing more than what we already knew, namely, that bulletins form a definite part of any safety program, it was satisfying to find out firsthand that people were actualy reading them.

I think that any safety engineer who is running out of ideas, or getting into that routine that we are inclined to fall into after a period of time might benefit by using a similar program for several reasons. First of all, it would bring him into contact with a good many individuals whom he might not otherwise have any occasion to talk to. Secondly, he will very likely find out that one or more changes in his present bulletin set-up are indicated, and thirdly, he may well discover that a different type of poster or display medimum will draw more attention.

The Free Bulletins & Catalogs Reviewed on Page 67 May Help You Solve Your Safety Problems

Fire Losses in '49

FIRES destroyed an estimated $667,536,000 in American property during 1949, a figure only 6.1 per cent below the all-time record for destruction set in 1948, it was announced recently by W. E. Mallalieu, general manager of the National Board of Fire Underwriters. This represented the first drop in annual fire losses since 1942.

Fire destruction in December, 1949, was estimated at $67,279,000, an increase of 26.7 per cent over losses of $53,116,000 reported in November, 1949, and a decrease of 3.1 per cent from losses of $69,397,000 reported in December, 1948.

After remaining at a fairly steady level during the years 1939 through 1942, American fire losses began climbing rapidly through the war and post-war years. Estimated fire losses for the past ten years are:

1940	$ 306,469,520
1941	322,357,000
1942	314,849,000
1943	380,235,000
1944	423,538,000
1945	455,329,000
1946	561,487,000
1947	692,635,000
1948	711,114,000
1949	667,536,000
Total	$4,835,549,520

These figures represent totals of monthly estimates.

The 1949 reduction in fire losses resulted from several factors, Mr. Mallalieu said. Among them were the intensified fire prevention programs in many American cities, and the slight drop in the general price level, which meant that the replacement cost of burned property was somewhat less in 1949 than in 1948.

"The annual fire loss remains at a very high level," he pointed out. "The 1949 total was more than double the 1942 total.

"Every American can help reduce this waste of the nation's resources by being careful with cigarettes and matches, which together cause a third of our fires, and by following the simple safety precautions which would make home fires a rarity."

Countless fires during 1949 were caused by faulty chimneys, stoves, and furnaces, by misuse of gasoline and other flammable liquids, and by defective wiring and electrical appliances, he said.

The monthly fire losses in the United States during the year were:

January	$ 57,926,000
February	62,424,000
March	67,218,000
April	55,290,000
May	54,162,000
June	51,787,000
July	49,592,000
August	50,150,000
September	49,678,000
October	48,914,000
November	53,116,000
December	67,279,000
Total	$667,536,000

These reported losses under fire insurance policies include an allowance for uninsured and unreported losses. The figures are based on fire and lightning losses only and do not include losses under any other coverage such as explosion.

Lineman's Safety Manual in Spanish Edition

THE Inter-American Safety Council has just published a Spanish-language booklet on the testing and climbing of poles. The well illustrated manual describes the correct and safe way to wear and use linemen's safety equipment and gives instruction in safe climbing techniques. The 28-page manual is for sale to non-members of the Council at a price of 75c per copy. Orders should be addressed to the Inter-American Safety Council, 2 Rector St., New York 6, N. Y.

HOW TO PREVENT

An outline of the importance of correct techniques and protective equipment in preventing accidents in laboratories and chemical storage rooms, based chiefly on the Fisher Scientific Company's "Manual of Laboratory Safety."

IN LABORATORIES where more than several persons are employed, safety programs should include the formulation of a safety code, regularly scheduled safety meetings, provision of safety equipment for every worker, and unfailing follow-up from month to month.

The fundamentals of safety remain constant, and once they are learned by the careful worker, they govern his actions somewhat automatically. A forthright program of education, a concise setting-forth of inflexible laboratory rules and an awareness by the head of the laboratory to the fact that his program must be carried out with vigor are other prime necessities in an intelligent attack against accidents.

Poor Storage Invites Accidents

One of the essentials for the safe operation of a laboratory is an adequate, efficiently planned storage room. The usual common-sense rules of storage should be painstakingly followed even in the case of apparatus and supply stocks that in themselves are harmless. Good housekeeping can only be achieved by prior planning and rigid adherence to an adopted plan.

The storage room should have a window or door opening directly to the outside, and a large blower capable of changing the air in the entire room quickly. If acids and ammonia are dispensed from carboys, the work should be done in a separate room having an exhaust fan. The storage room should be equipped with fire doors, safety lamps, fire extinguishers and a sprinkler system. A barrel or bucket of sand should also be provided so that sand can be shoveled on spilled liquids or used to smother a fire.

Generally, heavy items should be stored on or as near the floor as possible; apparatus and glass tubing should not project beyond the shelf front. Shelf clamps should be provided for bulky or fragile apparatus, and wooden ridges along the front of storage shelves reduce the danger of chemical spillage.

Special attention should be given to the preplanning of the arrangement of liquid reagents in the storage room to prevent hazardous combinations or heating. Chemicals which might react together to produce dangerous fumes, fire or explosion demand storage space remote from each other. Volatile liquids, of course, must be kept away from heat sources, sunlight and electric switches.

Chemicals containing inhibiting agents, as well as those in vessels having vent caps or other means of control over reaction characteristics should be accessible for daily inspection.

Cylinders of gases in storage should be capped, supported to prevent toppling over, and placed away from heat and open flames.

Matters of aisle clearance, proper ventilation and adequate lighting with approved enclosed lamps are of extreme importance and are quite properly the concern of every person who enters the storeroom. It is outside the bounds of safety to let even the smallest amount of waste accumulate on the floor surface or in corners. The head of the laboratory should be certain that the janitors and maintenance men have a thorough understanding of the precautions that must be observed.

Plan Movements Before Handling

With storage properly taken care of, the next step of concern to the person in charge of safety is the transfer of fragile apparatus, chemicals, gases and liquids of all types from the storage room to the laboratory where they are to be used.

To facilitate handling of carboys and other large vessels, inclinator cradles on casters or suitable siphoning devices should be standard equipment. Smaller bottle tilters also are available commercially. Rubber gloves and aprons, as well as goggles, should be placed within easy reach of persons entering the storeroom, and use of these protective items should be demanded of everyone.

Mechanical devices eliminate the lifting of unwieldly crates, bottles and cans manually, and facilitate controlled pouring. Protective gloves, safety shoes or boots, shields, aprons, sleeves and respirators cover the possibility of accidental dropping, breakage or spillage. Drums should be mounted horizontally, securely braced to prevent rolling, and tapped—with small, sand-filled metal boxes placed on

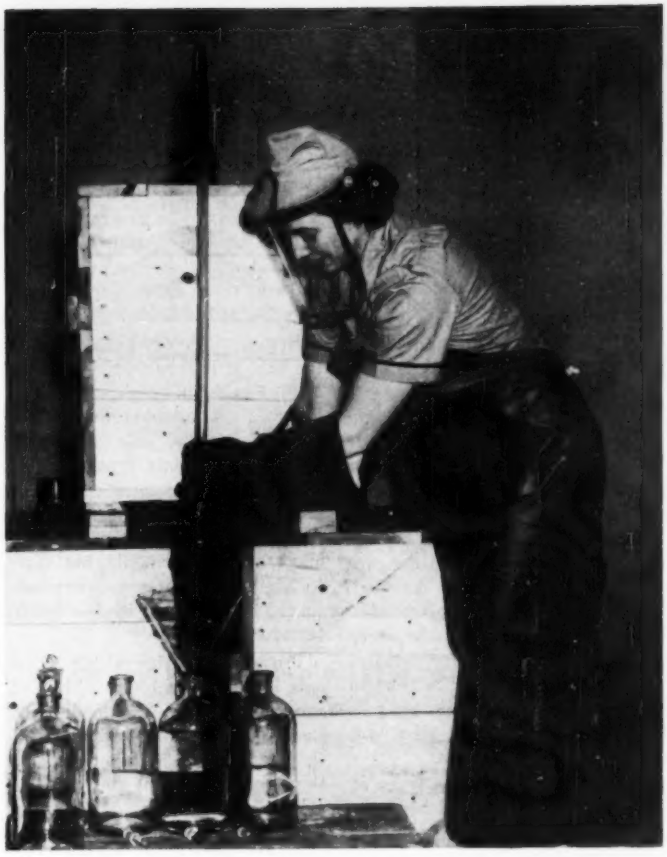
the floor under the taps to absorb drippings. A faucet with spring closing action and locking pin is recommended. Be sure that soda ash or bicarbonate of soda is at hand before pouring acids.

Flammable liquids which are dispensed from larger containers should be carried in safety cans.

Never fill a receptacle with material other than that called for by the label—and label the container before filling.

In transporting heavy cylinders of compressed gases, a trussed handcart should be provided. Never move two cylinders at the same time unless they are properly banded together. Under no circumstances should cylinders be rolled on their own bottoms, bounced or jostled; nor should cylinders of chlorine or hydrogen sulphide be handled by only one person. Immediately after they are positioned for use, cylinders should be clamped tightly with a safety support to prevent shifting or toppling.

If exact information is not received with a shipment of new or



LABORATORY ACCIDENTS

unfamiliar types and potencies of chemicals for special work, request the manufacturer to furnish his recommendations before proceeding with laboratory use.

Proper Techniques

Faulty technique is one of the chief causes of accidents and, because it involves the human element, is one of the most difficult to cope with. Good technique in assembling apparatus correctly, handling materials properly, and proceeding methodically minimizes the chances of accidents.

FEATURE

This is the third of three feature articles on the Safe Handling of Chemicals. The first two articles, dealing with handling chemicals and shipping chemicals, appeared respectively in the December and January issues of SAFETY ENGINEERING.

Preached from elementary chemistry on through a professional lifetime, one simple maxim is universally known: "Pour acid into water—never pour water into acid."

Acids, because of their nature, prevalence, and variety of concentrations, constitute a series of hazards ranging from poisoning, burning and gassing through explosion. Most of the hazards can be overcome by proper technique.

The laboratory worker should

always flush the outside of acid bottles before opening them. Don't lay the stopper down on any surface where the next person may rest his hand or arm. Keep acid bottles stoppered tightly and flush and dry them before replacement on the reagent shelf. Make certain that no spillage remains on tables, floor or bottle.

Protective Clothing

Although correct techniques can eliminate many accidents, no laboratory worker is safe unless he is suitably dressed for handling chemicals. Laboratory projects which involve small quantities of chemicals may not require as complete and elaborate protective clothing as that needed in the storage room where large quantities are being transferred or handled. Nevertheless, a small splash of a concentrated acid can be very dangerous. It is better for chemical workers to take the extra time to put on aprons, coats, gloves, goggles, etc. than to regret their lack of precaution afterwards.

There are innumerable types of protective clothing available commercially. Aprons may be of the waist type or the bib type in various lengths. In addition, they may be plain, have a gutter around the bottom to catch spillage, or have split legs for greater freedom of movement.

Many kinds of gloves are available, but those most suitable for persons handling chemicals have a gauntlet cuff or an elbow-length cuff. The ends of the cuff should be turned back a little to prevent the run-off of drippings. Some of the newer types of gloves have the fingers molded to the shape of the hand for greater facility in handling. Protective sleeves are available in either elbow- or shoulder-length.

One of the most important considerations in selecting protective clothing is the type and grade of material used in its manufacture. This applies to hoods, coats and sleeves, as well as to aprons and gloves. Clothing suitable for chemical work is often referred to in a general way as being made of "rubber." Today, however, this clothing may be natural rubber, synthetic rubber, plastic, or a fabric coated or impregnated with any of the materials. The choice of material should be governed by the nature of the chemicals to be handled and the amount of wear and tear to which the garment will be subjected.

In general, natural rubber offers the best resistance to concentrated acids, alkalis, and their salts. It is, however, not suitable for work with solvents or oils. For the latter classes of materials, synthetic rubber and plastic garments are more serviceable. Synthetic rubber and plastics give protection against many acids and alkalis, but their suitability for specific chemicals should be confirmed by the manufacturer.

Protective clothing with a fabric base is generally able to withstand rougher use than those made from sheets of rubber or plastic. One of the more recent developments in this field is the use of glass cloth as a base for liquid-proof coatings. The glass cloth provides great strength and, when coated with rubber or a suitable synthetic, is virtually unaffected by the strongest reagents.

Fume Hazards

The liability of exposure to harmful fumes is a real hazard to the health of laboratory workers. Every technician knows that a good whiff of poisonous gas may cause serious illness. Yet, some neglect to take precautions or to consider the cumulative effect of daily exposure to toxic fumes and vapors.

Unit ventilating systems are efficient only when contaminated air is carried away rapidly to the outside air without danger of reentering the building. Single fans or small systems cannot be expected to expel an emergency overload such as occurs when a large container of volatile material breaks.

In every procedure which may produce toxic fumes or vapors, local exhaust ventilation should be applied. Remove harmful gases and vapors at their source. A practical general rule to follow is to zone the field and permit no one to be present except the person performing within the field. The use of a fume hood with adequate displacement of air through multiple vents immediately confines the contaminants and provides for harmless dispersal to the outside.

Almost too obvious to be mentioned is the hazard when working with toxic gases such as chlorine, hydrogen sulfide, carbon monoxide, hydrogen cyanide, etc. Always wear a gas mask with an absorbent specific for the gas being used.

Avoid Confinement of Gases

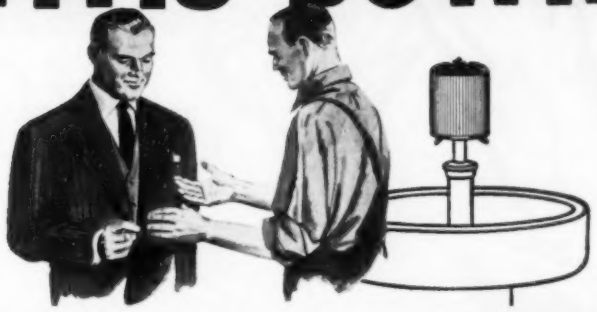
Of first importance in laboratories working with volatile flammable materials, the fundamental rule to remember is that heat causes expansion and confinement of expansion results in explosion. Work only with small quantities so that any explosion will be comparatively harmless. Remember that some reactions are exothermic, so that danger exists even though external heat may not be applied.

An open flame or electric spark may set off an explosion. If a separate room is not provided for work with explosive materials, an excellent general rule to follow is to prohibit open flames or unshielded electric contacts. For protection of the worker, explosive materials should be worked with only in a fume hood with a safety glass window, or with a safety shield in front of the apparatus.

Check temperature regulators or drying ovens at least weekly. Provide ovens with doors that open automatically on slight positive pressure from within—then surround the apparatus with a substantial screen cage. In pressure equipment, always see that they are equipped with gauges and with safety valves.

Don't neglect *(To page 36)*

DERMATITIS DOWN



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Personnel

THE public is getting tired of squabbling between management and labor, and accident prevention is a field where both sides can get together. This warning came from Harold C. Zulauf, vice president in charge of operations and industrial relations for Alexander Smith and Sons Carpet Co., Yonkers, N. Y., speaking on top management in safety before the annual meeting of the National Safety Council recently.

"John Q. Public is a very patient individual, but he is getting a little bit fed up on the never-ending brawls between management and labor," he said. "Both of these groups can regain a great deal of prestige, which has been lost, by honestly and conscientiously getting together in the field of industrial safety which, in far too many cases, has only had lip service from both sides."

He said management must assume its obligation to have a sincere interest in safety and express it by providing safe working conditions, machinery, equipment and personal safety protective devices and apparel.

Mr. Zulauf also pointed out that labor has a moral obligation, through every individual employee, to make a safety program work.

"There must be," he said, "full and complete cooperation between the employer and the employee. . . . All the work done . . . will be ineffective unless there is a cooperative effort between all involved at the level where people get hurt."

Active Interest Needed

Greater personal interest on the part of management today was presented as a major ingredient in any accident prevention formula.

It was proposed by E. F. Tuck, master mechanic of the St. Louis-San Francisco Railway Co., in an address before the railroad section of the National Safety Congress.

He suggested to management this extra effort should come in more personal interviews with those responsible for passing along the safety story, more personal interest in accident prevention literature, more personally-conducted safety meetings, more personal attention to providing safe conditions under which men can work.

"Safety," Mr. Tuck said, "is a sales proposition that never ends. The fact that we have one good month does not insure that the next month will be just as good or better, unless the proper effort is put into it to know that our workmen are safeguarded and working along safe practices, that the foremen stay in close contact with their men, hearing and taking action on the various complaints of unsafe conditions and practices which exist."

He pointed out that improvement in accident prevention will come only when every worker is fully conscious of safety while realizing that management will insist on observance of safety rules.

"Let us remember," he concluded, "that one thought for safety is worth a thousand regrets, that the careful man, his family and home—these make America great!"

Training Programs

Learning by doing, but under close supervision to catch mistakes, was proposed as a means of furthering the cause of accident prevention.

The formula was presented in a talk by C. H. Weiser, plant personnel supervisor of the Southwestern Bell Telephone Co., Kansas City, Mo., before the public utilities section. He said that a good on-the-job training program should be conducted by capable instructors who will permit an apprentice to go through the duties to be required of him but with close guidance in the proper way to do the job.

Mr. Weiser added that supervisors in smaller organizations often claim they do not have time to train men, not realizing they are training workers in a haphazard,

Problem Discussions Help Safety

unorganized manner which will result in poor workmanship and perhaps a serious accident.

"As soon as the managerial and supervisory personnel," he said, "find out that organized training is easier to do and more effective, they will be willing to handle their training intentionally and on a definite basis. The principal reason for adopting this method, aside from the fact that it pays off in production, is that it eliminates a lot of the headaches of the supervisory organization due to poor quality, ruined material and service failures."

How to Train Personnel

Learning by doing still is a mighty handy practice. K. W. MacDermott, training officer of the Hydro-Electric Power Commission of Ontario, Canada, told the public utilities section that diagrams and talks are an important part of safety training, but better results will be achieved if the worker is shown the proper way of performing his job in actual practice.

"If a person wanted to learn to swim," he said, "he would never be able to swim by looking at pictures or reading books. It is true that both the pictures and the words might help, but the person would never be able to swim until he actually got into the water and used his arms and legs."

Mr. MacDermott also urged management cooperation in any employee safety training program which requires proper supervision if it is to be successful. He pointed out that certain requirements must be established for any course so that the students have a definite plan to follow in reaching a desired goal.

"If an attempt is made at production without training," the speaker warned, "then production does not reach its maximum capacity for the manpower available. In addition to loss of possible production, management and supervision leave the door open to accidents, waste of time, and waste of material."

Safety Engineers Analyzed

Safety engineers had themselves analyzed at the National Safety Congress. And it was demonstrated to them that their success hinges on more than a knowledge of accident prevention. Edward G. Holtzman, chief of the safety and medical departments of the industrial relations division of the Wagner Electric Corp., St. Louis, was the consultant in the case.

Addressing the pulp and paper section, he listed enthusiasm, sincerity, tact, courtesy, cheerfulness, friendliness, initiative, persistence, memory and application as necessary attributes for a man directing a safety program.

"To my way of thinking," he reported, "the sum total of these qualities is salesmanship. A safety director must possess salesmanship for he is called upon to sell safety to the entire plant."

Need for Sincere Efforts

The National Safety Congress was told that sincerity is a mighty good cornerstone for the foundation of any safety program. E. F. Harmison, manager of the General Electric Co. plant, DeKalb, Ill., cautioned the power press section that an accident prevention program launched by a management not sincere in its safety efforts has little chance for success.

"If the same sincerity of purpose and follow through," he said, "is observed in a safety program to protect employees as is observed in meeting production schedules to serve the customer, real results will be accomplished."

Mr. Harmison also had a word for operators of power machines. He told them that for their own well-being they should be fully familiar with their machines and know the reason for every safety device installed on the machines.

"The operator," he said, "who looks upon a guard or a safety device as just a part of the machine and not as a special and distinct item created for his own protection, will never be as alert and safety conscious as he should be."

Selling the Program

A lesson in selling life—not life insurance—was conducted at the National Safety Congress.

W. W. Miller, director of industrial relations for the Stewart-Warner Corp., Chicago, told the power press section that a successful safety program is based on sound selling.

He said that the job must start with convincing the executive head of a plant that such a program is necessary. It then progresses through the foremen and supervisors into the final stage, and usually the most difficult to accomplish, of selling the worker who is the one most directly affected. However, he added, employees and

unions representing employees can be sold on the need for safety measures if the program is presented properly.

"And if you make the sale," he concluded, "the program will flow smoothly. If you don't, you may have troubles."

Backing by Management

Saving lives is just as much a job for the boss as it is for the worker whose life is at stake. That is what C. W. Hooper, of the Stewart-Warner Corp., Chicago, told the power press section of the National Safety Congress.

"While it is true," he said, "that there is only one man who can prevent an accident, and that is the employee, constant education through supervision will keep the employee alert to the best methods of performing hazardous operations."

Mr. Hooper, who is secretary of the manufacturing and engineering policy committees of the company's die casting division, urged top management to express continued interest in accident prevention programs and to let supervisors and workers know that "the big bosses" are anxious to help whenever possible.

"Without the backing of management," he declared, "the individual safety man is helpless."

Education Down the Line

The National Safety Congress was told that industrial accident prevention is largely a matter of every employee of a company—from top supervisor to newest worker—going to school. T. Earl Hawkins, manager of industrial relations of Consolidated Gold Mines, Ltd., Timmins, Canada, offered this prescription for an accident cure in a talk before the mining section.

"Assuming that top management has accepted its responsibility for accident prevention," he said, "then, if unsafe acts and conditions are to be reduced, the fundamental problem is indoctrination of line supervision and, through them, all employees."

He said indoctrination can be brought about only by teaching, by training, by instructing and by personal example. The reason for such a training program, Mr. Hawkins reported, can be found in accident records which reveal that 75 per cent of accidents can be wholly or partially attributed to unsafe acts on the part of employees.

Both to Blame

Both management and labor were indicted for coal mining accidents by C. Fremont Davis, safety director of the United Mine Workers of America, who placed the blame for periodic mine disasters at the doorstep of both employers and workers in a talk before the coal mining section.

"Regardless of opinion on this subject and no matter what the cause of ignition may be," he declared, "all explosions are the direct results of ignorance, indolence, carelessness or inefficiency on the part of management."

Turning to the employees, Mr. Davis declared:

"On the other hand, I also believe that miners must be made to realize that they too can prevent accidents by doing their work in a safe manner, that they must accept any innovations, mechanical or otherwise, that will increase safety to themselves or others. . . . They must be brought to realize that unnecessary gambling with their lives profits no one, least of all themselves and their families."

Mr. Davis declared that progress has been made in reducing mine accidents, but he said that the job won't be completed until accidents are completely eliminated.

He called for increased interest in safety programs on the part of management, selection of competent supervisors and foremen who are able to teach the miner safe methods of working and further cooperation on the part of miners to make safety programs work.

It's Everybody's Business

Accident prevention is everybody's business and when everybody tends to business, accidents decline in number. This was the safety philosophy offered in a talk by Oscar A. Glaeser, industrial relations manager of the United States Smelting, Refining and Mining Co., Salt Lake City, Utah.

He reported that accident prevention is an integral part of operations at his firm. "Accident prevention has not been and is not now set aside as the responsibility of any one or several individuals," he said. "Furthermore, operating department heads have tackled the job of accident prevention with enthusiasm and it is their enthusiastic support and the wholehearted cooperation of the employees that has made possible the consistent improvement of the safety record."

The speaker also said it is the duty of every company to provide employees with protective apparel and equipment safeguards.

Pulling Together

That old team spirit doesn't apply only to athletics. It can be a potent factor in industrial accident prevention. J. Forrest Smith, supervisory training specialist of the business training bureau, extension division, University of Texas, reported to the petroleum section of the annual meeting of the National Safety Council that close cooperation between all persons, management and labor, will effect accident prevention.

"Safety," he declared, "will improve at the same rate that harmony and efficiency improve in the organization."

He urged that workers be given a working role in planning safety programs, that they be consulted in certain decisions and be made to feel they actually have a living part in helping save their *(To page 53)*

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TRANSPORTATION

It's the Humidity

MOTORISTS troubled by rust on their cars can blame it on the humidity. According to a paper presented by F. L. LaQue and E. J. Hergenroether of The International Nickel Company, Inc. before the Society of Automotive Engineers, "the humidity of the atmosphere where a car is kept or parked is a more important factor than salt treatment of roads in determining the extent of corrosion of automobile underbodies."

The study of corrosion made confirms the fact that cars will rust whether or not a community uses rock salt, pointing out that "field surveys have shown almost as much corrosion of cars in areas where salt treatments of roads are never employed as in regions where they are used regularly. Furthermore, surfaces located where they are shielded from salt splashed from the road have been found to suffer as much damage as those freely exposed to such splashes."

Emphasizing the extent to which atmospheric conditions are responsible for corrosion, the report states that "steel specimens exposed to atmospheric corrosion without contact with brine were corroded twice as much as duplicate specimens attached under a test car driven over a salt treated road and garaged in a humid atmosphere."

To minimize corrosion, the report states, "car owners can help themselves most by keeping or parking their cars where they will have a chance to dry quickly and by washing them often enough" to get rid of lumps of mud and dirt which cling to the under parts of their cars and hold moisture against the metal surfaces.

In ordinary times it is the second or third owner of a car rather than the initial one who has trouble with corrosion. During and after the war, however, when cars continued in their first owners' hands for longer periods of time than formerly, these owners became more aware of corrosion than before.

Other studies of corrosion have also established the fact that some of the worst rusting on a car occurs between doors and the body frame, and inside window frames, far from any water or brine that may be splashed up from the road. Condensation water from the windows runs down on the inside of the car and is pocketed there because seep holes become plugged by road dirt. To eliminate this stoppage, owners should wash down the under parts of their cars at regular intervals.

Drivers & Conditions Cause Most Accidents

AN ANALYSIS of last year's automobile accidents prepared by the Travelers Insurance Company shows that only one in ten crashes was caused by any kind of mechanical failure in the cars. Since the car, the road and the driver are the three factors involved in any accident, this means that the others were the fault of bad road conditions and the drivers. And 98 percent of the drivers were experienced, with one or more years of practice.

National Safety Council accident figures reveal that December is the most dangerous month of the year on streets and highways, with January and February also high on the list. More crashes occur then than in other months, in spite of the fact that people use their cars less in the winter than they do during the spring and summer. Longer hours of darkness and dangerous highway conditions caused by snow and ice are among the factors that account for this seasonal increase in death.

Since nothing can be done about the hours of darkness, safety engineers in recent years have emphasized the importance of developing local programs to remove snow and ice completely from streets and highways. Many commissioners use rock salt for this purpose, because it is both fast and economical and, unlike abrasives, provides a bare highway surface. Complete removal is essential to maximum safety, since tests conducted by the National Safety Council show that a car going only 20 miles an hour requires eight times as much space to stop on ice as it does on bare road surface.

Last year automobile accidents killed and injured close to a million and a half people, and indications are that the total will be even higher in 1949. In an effort to reduce this total of dead and injured during the coming months safety groups are urging that motorists drive slowly and that snow removal crews work fast to provide snow and ice free roads during and after winter storms.

New Transportation Film

A NEW colored sound moving picture entitled "Industry in Action" will soon be available for showing before interested groups. The picture was recently previewed by the National Automobile Transporters Association in Detroit. "Industry in Action" is a pictorial educational record of the activities on the Accident Prevention Division for the N.A.T.A. Mr. W. H. Boutell, board chairman said that the film will be shown nationally before industrial, civic and educational groups.

Rubber in Road Building

Experiments Underway for New Uses of Rubber

ADDITION of rubber to asphalt for roadbuilding is the most notable new use of rubber, members of The American Society of Mechanical Engineers were told recently at their annual meeting in the Hotel Statler, New York City. Although the usage is relatively small percentage-wise, it gives promise of utilizing tremendous quantities, according to Lois W. Brock, G. H. Swart and E. V. Osberg, of The General Tire & Rubber Company, of Akron, Ohio, who presented a review of the advances in rubber during the past year.

There are test roads in the Netherlands and in Java, one in England laid 12 years ago, rubber streets in South Africa and several test strips in the United States including Ohio, Texas, Minnesota and West Virginia.

A noted Dutch rubber technologist, Dr. R. Houwink, has reported that a rubber-asphalt road between Rotterdam and Amsterdam withstood heavy German war traffic, the review stated. Dr. Houwink's visit to this country during the past year accelerated this use of rubber, and since then many states and communities have undertaken the building of such roads. In this development, natural rubber seems to have a definite technical edge over the synthetic product.

"A layer only one millimeter thick of rubber asphalt composition is said to be all that is necessary to protect and seal a road construction of coarse asphaltic concrete and such a surface is said to have good anti-skid properties."

"In this type of work," the paper continued, "rubber is utilized in powder form and considerable attention has been given to rubber as a powder for various other applications, including use as a raw material for chemical developments such as rubber derivatives and possible rubber plastics, for applying as a protective covering in various types of articles, for simplification of rubber factory mixing processes and for new decorative effects and finishes."

Also cited as another development that has grown into considerable importance during the past few years, reaching a level of dominance recently, was the "nuclear" sole. It is based largely on synthetic rubber, high styrene-containing butadiene-styrene resins, and reinforcing fillers. Such soles are made with a hardness, stiffness and color that approximate soling leather, and have been reported to outwear leather soles by a considerable margin.

Rubber Roofing Material

A rubber roofing material in the form of corrugated sheeting, containing at least 35 percent rubber, is being tested in Malaya, Borneo, Java and Sumatra. It is claimed to be termite-proof and have outstanding properties of rigidity, lightness and non-corrosiveness.

"Foam rubber continues to be of considerable interest and is being used in increasing quantities," the authors stated. "Safety cushions of sponge rubber have been applied for automotive applications and a protective helmet for pilots of high-speed aircraft has utilized a padding of foam rubber.

"Containers for many applications such as packaging delicate apparatus utilize sponge rubber, and thermally insulated containers employ an inner core of expanded rubber. Enameled steel boxes with sponge rubber pads have been developed for accommodating two layers of 24 eggs. A rubber mat with a foam-sponge center promotes ice-cracking and removal during wintry weather. Sponge rubber is used as a backing for carpeting and for a vinyl resin floor covering."

Natural vs. Synthetic Rubber

The past year has witnessed continuation of the struggle between natural and synthetic rubber, according to the review. Some 200,000 tons of capacity to produce "cold" rubber were scheduled for completion last month.

"By the development of 'cold' rubber, synthetic rubber has made a significant gain technologically," it was stated. "However, natural rubber has gained the commercial advantage of a lower price structure. This economic advantage has been fortified by relaxation of mandatory usage regulations governing synthetic rubber.

"The impact of the American synthetic rubber industry on the plantation rubber has led to intensified efforts to prepare highly purified natural rubber as well as rubbers of controlled plasticity; the latter is achieved by the incorporation of chemical plasticizer in the latex at the plantation."

Glass Fibers Help Solve Industrial Problems

LIGHT-fast, shrink-proof draperies that need no ironing and are dry and ready to rehang seven minutes after washing, are a dream come true for many housewives. An electric motor which can be operated at an overload up to 50 percent without damage is now the boon of many a steel mill. These are only two of the many possibilities growing out of the use of glass fibers woven into textiles, according to John K. Park, manager, Textile Research and Development Department, Owens-Corning Fiberglas Corp., Ashton, R. I. He spoke at the 70th annual meeting of The American Society of Mechanical Engineers in the Hotel Statler, New York City.

The combination of many unique qualities in one material makes fibrous glass outstanding for a variety of products which help to solve everyday problems, said Mr. Park. Glass textiles, for instance, are noncombustible, and therefore answer the need for fireproof draperies in public places and the home. As glass fibers do not absorb water, curtains made of them will not shrink. Since only the surface gets wet when they are washed, drying is a matter of a few minutes. Because fibrous glass resists most chemicals, they will not mildew, fade or rot.

In addition to these advantages, glass in fiber form has a flexibility which gives textiles hand and drape qualities. Now that glass textiles can be dyed or printed in any color or shade they are finding a new use as decorative fabrics, Mr. Park said.

Cloth woven of fibrous glass yarns and coated with vinyl is another example of combining properties to provide improved performance. Convertible auto tops are now being made of this coated cloth which will last three to four years instead of the usual year or so.

Here again, the fabric will not stretch out of shape when it gets wet. It resists weathering, minimizes damage from cigarettes and similar misuse, and, because of the almost incredible strength of glass fibers, withstands pulling and tearing action during installation and subsequent use.

These same qualities are utilized in coated fabrics for awnings, upholstery, fender welt, gaskets and the like. Glass fabrics, Mr. Park added, also have industrial uses varying from water-proofing membrane for roofing to movie screens.

Used in Electrical Industry

"For the electrical industry these fibers provide a low cost insulation with great overload protection for all types of motors, transformers and other electrical equipment. In addition they are used in the manufacture of many types of wires and cables," he said.

The ability of fibrous glass to conduct heat can be varied at will between very low and relatively high limits, Mr. Park explained. When thermal insulation is desired, the fibers are used in bulk jackstraw arrangement, leaving millions of little air spaces between the fibers. On the other hand, where the rapid transfer of heat is important, as in the coils of a motor, the fibers, when laid parallel to one another in the form of yarns or tapes, will reduce the number of air spaces and increase the area of contact, thereby increasing the efficiency of the motor.

Glass in general is inherently a good electrical insulating material. The fact that glass fibers combine well with other electrical insulating material, are unusually strong, and also take up very little space, makes possible the design of smaller and better electrical equipment.

Plastics Offer Challenge

Fibrous glass "reinforced plastics have created a new structural material which offers a challenge to engineers everywhere," Mr. Park declared. "At the present time such plastics can compete with steel, aluminum and other metals in a great many applications."

The combination of high strength glass, which holds its shape, with comparatively weak and brittle resin, results in a material that is extremely strong and lightweight, has high impact strength and fine weathering and corrosion resistance with a minimum of swelling or shrinking. When glass fibers are used in combination with polyester resins, molding in any shape or size is easily done. The largest molding to date has been a 28-foot personnel boat hull in one piece, for the Navy, Mr. Park said.

One manufacturer of a spinner type washing machine tub and some 15 other fibrous-glass-plastics parts reported that part costs are about 50 percent less and tooling costs around 20 percent of what they would have been if he were fabricating in metal, said Mr. Park. The washing machine tub and many of the other parts outperform either aluminum or porcelain enameled steel, according to the manufacturer.

Fibrous Glass Incredibly Strong

The strength of fibrous glass in proportion to its weight is the greatest for any commercial material either occurring in nature or synthesized by man, declared Mr. Park. Fibrous glass is more than three times as strong as steel and six times as strong as aluminum in this proportion. More strength means less material required for a given job. Its lighter weight is reflected in less freight cost in shipping the finished product to more payload available in planes and trucks.

In another sphere, he said, "Consolidated Vultee's new Convair

uses over 80 reinforced plastic parts in its construction and the Air Force is experimentally producing air frames and helicopter blades with this material."

Their resistance to most corrosive chemicals makes glass reinforced plasties suitable for containers and trays in the food, photographic, chemical and similar industries.

"Shop Safety" Subject of New Book

SHOP SAFETY EDUCATION, by J. James Jehring, Frederick Theurer, University of the State of New York, 1949. 336 pages. Distributed by Delmar Publishers, Inc., Albany 1, New York.

The primary objective of this new book is the training in school shops for accident prevention in industry, in the home and on the farm. Tested accident prevention techniques are recommended for use by school shop teachers to insure a quick transfer of safety habits from school to actual employment conditions.

Contents include: Accidents and Accident Prevention; Administration of the School Shop Safety Program; Making the School Shop a Safe Place to Work; Guarding Machinery; Maintaining a Safe Place to Work; Personal Protection Devices; Accident Prevention with Problem Students; Hand Tool and Electric Portable Tool Safety; Safe Practices in Certain Kinds of Shops; Installing an Effective Accident Prevention Program; Promoting Industrial Safety by Public Agencies.

This new publication is widely recommended as a workable guide for every administrator or instructor under whose direction shop programs are carried out. It should prove an excellent student text in teacher training institutions and other programs where safety education courses are offered. Paper covers, plastic bound, $2.55. Cloth bound edition, $3.30.

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RADIATION PROTECTION

Three New Books and a New Detection Device

Safe Handling of Radioactive Isotopes

RECOMMENDATIONS for the safe handling of artificially-produced radioactive isotopes in the typical laboratory or small industrial operation are concisely set forth in a new handbook, *Safe Handling of Radioactive Isotopes*, just issued by the National Bureau of Standards and now available from the Government Printing Office. This handbook was prepared by the National Committee on Radiation Protection, established by the National Bureau of Standards and drawing members from the medical organizations of the United States, radiation equipment companies, and other Government departments including Public Health, Atomic Energy Commission, and the Military Services.

The increasing use of radioactive isotopes by industry, the medical profession and research laboratories has made it essential that certain minimal precautions be taken to protect scientists and technicians conducting research on radioactive isotopes, industrial workers handling such materials, and the general public. This handbook gives general safety recommendations which may be modified to suit the control requirements of different types of operations. Specific problems discussed are those of personnel, laboratory design and equipment, hazard instrumentation, hazard monitoring, and transportation of isotopes.

Handbook H42, *Safe Handling of Radioactive Isotopes*, 29 pages, 15 cents a copy, available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Remittances from foreign countries should be in United States exchange and should include an additional sum of one-third the publication price to cover the cost of mailing.

NEW LONG-PROBE MONITORING DEVICE

A LONG-PROBE radiation detector, which permits the operator to measure radioactivity from a safe distance, is demonstrated by Charles Lowmond, engineer for the General Electric Company.

He is using the new instrument to monitor a laboratory safe containing radioactive isotopes, which are enclosed in a heavy metal canister and surrounded by lead bars to prevent possible radiation.

Radioactive emanations, striking the new detector's tip, four feet from the operator, are converted into electrical energy, which indicates amount of radioactivity on the dial held by the operator.

Picture by courtesy of the General Electric Company.

Radioactive Wastes

A NON-TECHNICAL report on the safe handling of radioactive wastes in the atomic energy program was issued recently by the Atomic Energy Commission.

The report describes radioactivity and its biological effects, the types and sources of radioactive wastes in the atomic energy program, and the methods used for safe handling of wastes and protecting workers and the public from radioactive contamination.

The report also gives details about the extensive research program currently supported by the AEC to improve waste handling and storage methods. As better methods are devised, they are put into routine operation at atomic energy plants, often bringing about considerable savings in the cost of waste control.

For example, recent improvements in processing wastes from chemical separation plants have reduced by 20 percent the volume of liquid wastes which must be stored. It is expected that the

amount will be reduced to 50 percent in the near future, which will result in savings about a million dollars a year.

The report points out that gaseous, liquid and solid wastes appear at each of the various radioactive or "hot" steps in atomic energy processes. The methods of safe handling used to date have successfully protected workers and the public.

The ultimate goal of AEC's present research program is to improve the basic design of equipment to cut down waste at the source, rather than to attempt to deal with them by such means as filters and retention basins after they have been produced.

In carrying on its program for safe handling of radioactive wastes, the AEC relies heavily upon the individual programs of its prime contractors. In addition it draws upon the talents and knowledge of other Federal agencies, of State and local health officials and sanitary engineers, and of specialized industrial consultants trained in engineering and health techniques.

The report entitled, "Handling Radioactive Wastes in the Atomic Energy Program," may be obtained from the Superintendent of Documents, Government Printing Office, at 15 cents per copy.

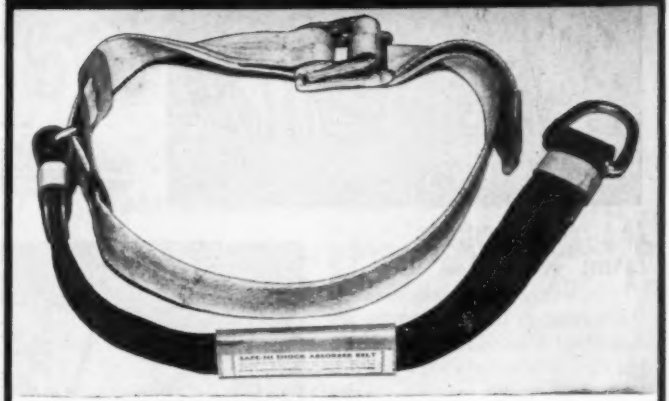
Measuring Radioactivity

SCIENTIFIC workers who are beginning research on problems of radioactivity and nuclear physics will find much valuable information compiled for their use in a new booklet, *Measurements of Radioactivity*, just published by the National Bureau of Standards and now available from the U. S. Government Printing Office.

This booklet provides in convenient form most of the essential background for all phases of experimental investigations in these general fields. Chapters deal with such topics as detection and measurement of radioactive radiations, measurement of ionization currents, radioactive substances, equipment for producing artifically radioactive isotopes, radioactive radiations, radioactive tracers, radioactive standards and units, radioactivity in geology, and health protection.

National Bureau of Standards Circular 476, *Measurements of Radioactivity*, by Leon F. Curtiss, 84 large double-column pages, illustrated, 35 cents a copy, available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Remittances from foreign countries must be in United States Exchange and must include an additional sum of one-third the publication price to cover the cost of mailing.

Safe-ti SHOCK ABSORBER BELTS



THE BELT THAT "PUTS ON THE BRAKE" when stopping a falling man!

Note the Unolyn shock-absorber, between belt and life line. The difference between a fall cushioned with this device and the violent jerk when a man hits the end of his lifeline in conventional safety belts—is the difference between stopping your auto with brakes or stopping it against a stone wall!

Unolyn (of the nylon family) has the amazing ability to elongate, without rebound, to several times its original length under such a load as a falling man. This s-p-r-e-a-d-s the impact—even when steel life lines are used. Men's lives are saved!

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Do You Need
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Lighting Units
Safety Belts
See the New Products
Pages 68–71

PROTECT YOUR HOSE LINES

Fig. 1. Use a reel for storing hose.

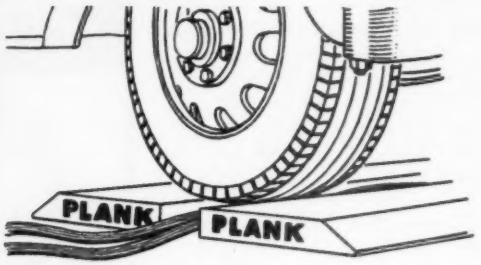

Fig. 2. Use planks to protect hose from vehicles.

THE welding hose lines that carry oxygen and acetylene from the regulators to the blowpipe are important items of equipment. Taking care of them pays off. Damaged, leaky hose wastes valuable oxygen and acetylene. Instead of doing a repair job for you, the gases disappear into the air. Of course, it's not safe either. Damaged hose can cause injury to you or damage the shop. So warns a recent issue of "Linde Tips" which goes on to make the following suggestions for protecting hose.

When storing hose, use a reel, as shown in Fig. 1, or lay it coiled on a shelf. Never hang it on a nail because it will kink under its own weight. Carry it to a new location

Fig. 3. Keep hose free of oil and grease.

—never drag it. Avoid kinking and chafing.

If hose crosses the path of a vehicle, protect it with planks, as Fig. 2 shows. Do not leave it where you may trip over it or trample upon it. A sudden pull may break a connection or upset a cylinder. It is often desirable to suspend hose from above to protect it from damage. A hose support can be made easily from welding rod and a length of pipe.

Hose should be kept free of oil and grease as these substances cause the rubber to deteriorate and are hazardous with oxygen. Any oil or grease that does get on the hose should be washed off with water, a little pine oil or resin soap, and a good cleaning powder. Never use gasoline, kerosene, or caustic soda because these materials will destroy the hose.

Pictures and story by courtesy of The Linde Air Products Company.

Laboratory Safety

(From page 24) wearing a face mask or protective goggles when working with explosive materials.

In general, if apparatus is likely to shatter either because of pressure or vacuum, surround it with mesh or cloth to limit the travel of particles. Vacuum desiccators should be shielded for assurance of safety.

Waste Disposal

Most laboratory workers are fully aware of the folly of pouring corrosive or volatile liquids down sink drainpipes and the necessity of destroying scrap sodium and potassium by slowly adding them to alcohol. Janitors and laboratory wash boys should be instructed in the proper method of disposing of these materials, since it is they who quite often have this task.

To protect janitors and maintenance personnel further, separate receptacles for broken glass, acids and inert dross should be provided and clearly labeled as to contents and best place of disposal. Volatile liquids require a clearly labeled, stoppered container.

Extremely hazardous compounds such as cyanides and fluorine compounds should be followed step-by-step by a check method from the time they leave the storage shelves through their final disposal. In this manner only, can the laboratory be assured that non-technical personnel (as well as laboratory technicians) are protected.

By pre-planning the movement of all unsafe chemicals and overseeing their final dissipation, conscientious proof of a well directed

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safety program is assured. Refuse should be collected at the close of each day or more frequently, if necessary. Under no circumstances should it be permitted to accumulate. The sooner a heterogeneous mass is removed from the laboratory proper, the less the chance of fire, explosion or release of fumes.

Picture by courtesy of The Alden Speare's Sons Co.

New Sales Division Formed by G. E.

EFFECTIVE January 1, 1950, the Apparatus Agency Division of General Electric's Industrial Divisions was replaced by a newly-organized Agency and Distributor Division, it was announced by C. H. Lang, vice president and manager of sales of the company's Apparatus Department.

George L. Irvine has been appointed manager of the new division, and upon his recommendation R. D. Moore was made assistant manager. They are responsible for the sale of all G.-E. Apparatus Department products through agents and to distributors, wholesalers, and dealers.

Small Plants Big Losers

THE big loser in industrial accidents is the small firm, states an article in the December issue of the "California Safety News," which points out that from 70 to 80% of the cost of occupational accidents in California are paid by the owners of small firms.

Of the California total of over $230,000,000 a year in accident costs, the small plant owner pays more than $173,000,000. "A shameful and tragic waste," says the article, "for *95% of the loss is preventable.*"

The fact that the small plant owner suffers heavily from the lack of a well-organized safety program is illustrated by figures given in the "California Safety News." While plants with over 500 workers had an accident frequency rate of 10.13—a little over 10 disabling injuries for each million man-hours of work—plants with 100 workers or less had a frequency of 21.94, or more than double.

"It is clear that the smaller the plant, the higher the accident rates," says the article, which outlines a program by which small plants can reduce occupational accidents to a minimum. Its facts and figures support the conclusion that no plant is too small for a safety program.

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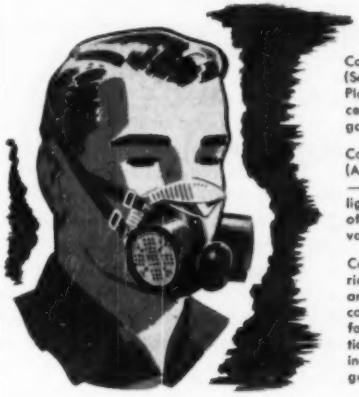
Chemical Cartridge Respirator



Code "A" Cartridges (Soda Lime)—White Plastic for light concentrations of inorganic acid gases.

Code "B" Cartridges (Activated Charcoal)—Black plastic for light concentrations of organic chemical vapors.

Code "AB" Cartridges (Soda Lime and Activated Charcoal)—Yellow plastic for light concentrations of combined inorganic and organic gases.

Sample sent $4.50 pp

Extra Cartridges 70c a set

Unit has DUPOR "controlled-breathing" valves. Double filter apertures hold 50cc. capacity chemical cartridges. Soft rubber face mask gives gas-tight fit on any shape face, as well as panorama view with no blind spots. Chemical filters are packed in colored plastic cartridges that will not corrode like metal ones or crush like paper types. Unit is shipped with code "B" cartridge unless otherwise specified.

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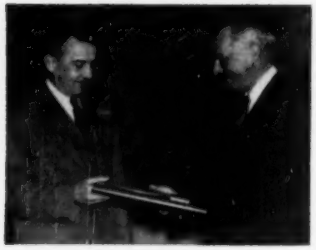
New Products for February

New Press Guard	Molded Work Gloves
Hydra-lizer for Ladders	Plastic Link Mat
Gunk in Quarts	Fluorescent Magnifier
Dry Chemical Extinguishers	Lightweight Tote Boxes
Shock Absorber Belts	Emergency Beacon
Sanikins	Burn Ointment
Fluorescent Lamp Disposal	Electro-Lock Shield
Automatic Press Feed	Neo-Cork Soles
	Flash-O-Graph
	Fluorescent Lamp Guard

See Pages 68–71

Ebasco Presents '49 Safety Awards



C. E. Calder, right, presenting the Ebasco Gold Plaque to W. W. Lynch, pres. Texas Power & Light Co.

MR. C. E. CALDER, Chairman of the Board, Electric Bond and Share Company, presented Ebasco Safety Award plaques and certificates of achievement to the presidents of Ebasco client companies at the Hotel Roosevelt in New York City on December 5th.

W. W. Lynch, President, Texas Power & Light Company, received the Ebasco Gold Award on behalf of his company for having achieved an Injury Index 90.78% below the national average for the award year July 1, 1948 to June 30, 1949. The Ebasco Silver Award was presented to A. B. Paterson, President, New Orleans Public Service Inc. for the company's gas and electric departments, whose Injury Index was 87.24% below the national average.

Certificates of achievement were awarded to R. I. Brown, President, Mississippi Power & Light Company; C. S. Thorn, President, Birmingham Electric Company, for Electric Operations; N. C. McGowen, President, United Gas Pipe Line Company; J. B. Poston, President, Columbus and Southern Ohio Electric Company, for Transit Operations; H. E. Meade, Executive Vice President, New Orleans Public Service Inc., for Transit Operations; H. J. Underhill, President and General Manager, Superior Water Light & Power Company; and S. V. O'Lenic, President, West Tennessee Gas Company.

In judging exceptional achievement, from among a variety of utility operations including electric, gas, transportation, and such organizations, which currently compose the Ebasco client group, the problem was to arrive at an equitable basis for comparing efforts toward safety. An Injury Index, based on frequency rate plus ten times the severity rate, was the solution.

Each year every company in the Ebasco group which achieves an Injury record which is 25% or more below the national average for their particular industry receives recognition. The company that achieves an Injury Index which is the greatest percentage below the national average receives a gold award and the company with the next greatest percentage below the national average receives a silver award. The other companies receive certificates of achievement.

In presenting the awards, Mr. Calder stressed the importance of accident prevention in industry and commended the attention of top management to the problem. In concluding the ceremonies, Mr. Calder said, "Among the companies honored this year are some who had very poor records in years gone by. The fact that they have now achieved good records shows that accidents *can* be prevented."

Safety is Not Window Dressing

(From page 15) building and construction work. It was not thought unreasonable to expect one fatality for every floor of a building under construction; or that two men might well lose their lives per mile of tunnel driven; or that one employee could be expected to donate his future for every million dollars spent on a general construction project. Fortunately for all of us, this approach has long since been discarded. No person is expendable.

In a great many accidents there is damage to equipment as well as injury to an employee. In other accidents there is damage to equipment or buildings even though no personal injury is involved.

Such avoidable accidents, resulting in property damage, as in the case of disastrous fires or explosions, entail losses of millions of dollars. Even though these property losses are items that must be included in the total cost of accidents, all of us are in complete accord that accidents to property are of less importance than accidents to people. The first quick question—"Was anyone hurt?"—is common to all of us at the time of such an accident. It precedes any question relative to property damage.

Safety Aids Efficiency

No intelligent person questions the importance of safety engineering to the welfare of the employee. On the other hand, many do not realize its value as an aid which can be used throughout the factory to build efficiency.

Safety engineering's contribution to production can be divided into three main categories. In the first category we might place lowered *direct* costs of accidents, which we will call compensation and medical payments. In our own plants in the United States, direct accident costs in 1948 were more than $150,000 below 1947 costs. They were more than half a million dollars below manual-rate premium figures. Similar savings have been made by other firms. Accident costs must be added to the cost of each item produced and in some instances this has made the difference between profit and loss—between staying in business and failing.

Safety engineering's second category of contributions to production is the lowering of the numerous *indirect* costs of accidents.

All accidents delay work. Even the needed precautionary first aid attention for a minor cut causes an interruption to production. In a serious accident, time is lost not only by the injured employee, but

also by other workers in the department or plant. A disabled employee requires a replacement. This involves costly training—in many cases resulting in waste of material and loss of production during the period.

An indirect cost of accidents that is often overlooked is the effect that they have on the morale of other employees. Accidents and their causes, such as unguarded machinery, poor housekeeping, and poor employee-training have a depressing effect on every employee. They will in most cases greatly reduce his efficiency and may eventually cause him to look for another job—that is, if he is lucky enough to escape death or disability long enough to do so.

Such indirect costs have been variously estimated, and general statements about them may have little bearing on a particular plant's experience. However, the fact that indirect losses may be twice the direct losses or ten times the direct losses is less important than the fact that such losses are the price of lack of control, the price of inefficiency.

What I have classed as the Safety Engineer's third category of contributions to production is probably the most important of all, and people who are engaged in accident prevention work have been given little credit for it. Too much emphasis has been placed upon the prevention of accidents, with its too frequent *negative* inference. It can be clearly shown that successful accident prevention is a *positive* contribution to the quality and quantity of production. Safety engineering doesn't merely save something, or prevent something; it also *adds* something.

Too little recognition has been given the fact that *all of the measures taken to prevent accidents also improve production efficiency.* Always have it in mind.

Accidents & Inefficiency

Every accident is a symptom of something wrong in the operation —some fault in design, equipment, arrangement, placement, training, supervision, operating procedure or practices. These basic causes of accidents are also the basic causes of inefficiency.

Safety means doing things the right way—the "one best way" which is the goal of efficient management. Safety is not negative, but intensely positive. Safety engineering efforts can accomplish these eight worthy ends: (1) reduce costly interruptions and delays; (2) improve the productivity of workers by better placement and training procedures; (3) benefit employee relations by use of the non-controversial subject of accident prevention; (4) improve worker's morale by increasing the desirability of work in a given company; (5) help train supervision to do a better job with its workers; (6) increase loyalty of employees by the interest that they develop in maintaining outstanding safety records; (7) improve plant house-

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New Firm to Make Plastic Coated Gloves

LOUIS K. BRAUNSTON, active in the rubber and plastics business for the past 20 years, has announced the formation of the Champion Glove Corporation with factory and executive offices located at 850 Metropolitan Avenue, Brooklyn, New York.

The new firm, of which Mr. Braunston is president, will manufacture plastic coated industrial work gloves. The company's patented formulation process, which uses a highly abrasive-resistant plastic, produces a rubber-like coating on cotton and canvas gloves that is impervious to most acids, oils, solvents and industrial chemicals.

Two trade-marked brands will be marketed to the industrial and household trades through leading distributors, jobbers and department stores. A special department has also been set up to coat wire, metal parts, cord, belting, tools, et cetera, with the patented process.

The other officers of the new concern are Arthur A. Mayers, vice president and general sales manager; Henry R. Seidman, secretary and assistant sales manager. Morton B. Harley is factory superintendent in charge of production.

keeping; and (8) help design more productive, efficient equipment and help lay out more efficient plants. Safety thus has a unique, intimate relationship with management all the way down the line. Safety programs based on these principles bring returns in dollars far greater than the savings which are the direct result of accident prevention.

Safety Reduces Delays

Many of the inspection programs and security devices set up by the Safety Departments in various plants not only prevent accidents to employees but also detect unsafe conditions that would cause breakdowns in machinery operations and thereby interrupt production. Relief valves on pressure vessels, primarily installed to provide safety, frequently aid the continuity of operations. Therefore, we see in this one phase of safety work the by-product of more efficient operations.

Safety Increases Productivity

A good safety record depends upon every act of the workman being done in the right way, which is the safe way. In the effective safety program, the supervisor must properly instruct and train each worker in the correct way of doing the job. If this is done, not only will accidents be prevented, but there will be less scrap, higher production, and fewer damaged machines and equipment. In safety work great emphasis is put upon the proper placement of employees. This is especially true in the case of handicapped workers. It is not difficult to prove that proper placement of employees is of great importance not only in safety, but also in efficient plant operations. It also affords a major opportunity to foster good labor relations. In brief, we *must* see that we get the right men and women on the various jobs.

Safety Improves Relations

The opportunities present in point No. 3—Improvement of employee relations through use of the non-controversial subject of accident prevention—are often overlooked. The participation of the employee and the foreman in accident prevention efforts in most cases can be used to help their relationship. In our own plants we encourage all members of our supervisory staff to talk with each employee at least once a month on some safety item. At the present time, the tabulation of the reports on these discussions that we receive from our supervision indicates that all employees are being contacted at least twice a month. We are of the opinion that this program has paid the biggest dividends of anything that we have done in safety promotion.

Such a program is strongly recommended not only for more effective accident prevention but also for improved labor relations. A closer relationship between supervision and employees is likely to prevent the start of many grievances. In addition, the participation of the employee in the different aspects of the safety program gives him a feeling that he is "part of the team." Frankly, supervisors probably do not talk enough with their men—especially about subjects that afford them a viewpoint in common. All those who hold supervisory positions should have in mind that a by-product of accident prevention efforts, cooperation between employees and employers, helps maintain production at high efficiency.

Safety Improves Morale

Item No. 4 is: Improvement in employee morale because of increased desirability of their jobs. In some industrial plants, the frequency of accidents was such that people worked there only as a last resort. Certainly the inability to secure good workers for such plants greatly hindered production. From a positive standpoint, plants with good lighting, guarded machinery, good housekeeping, adequate medical facilities, and effective safety programs are plants where employees have a high morale and in general do efficient work.

Safety Helps Supervision

Point No. 5—Help in training supervision to do a better job with its workers—has been a big part of the safety program in many companies.

For example, the National Safety Council's series of training films entitled, "Human Factors in Safety" not only help train the foreman and the supervisor to do a better accident prevention job but

also aid them in their general supervisory duties. They deal not only with safety but also with other aspects of production. In any well organized program, the safety training courses go far beyond the accident prevention field itself and make the supervisory employee a better all-round member of the management team. This might be considered an odd question to ask but it is a good one—Can each and every supervisor perform the individual jobs which he directs and can he do those jobs well, everything considered?

It should be pointed out that when a supervisor is not fully capable in every respect you can be confident that he is not an asset to the company's efforts to build good labor relations. There is nothing worse than to have someone attempt to oversee a job that he does not know how to do.

Safety Increases Loyalty

Item No. 6 is that loyalty of employees is increased through the interest that they display in outstanding safety records. This is one more phase of accident prevention work in which there is a by-product that increases production efficiency. In our own company, outstanding safety records have been compiled by both plants and individual departments. It is quite apparent that the interest taken in these records by employees who have been responsible for them has increased their loyalty to the company and to their jobs. It is also quite apparent that good, safe working conditions give the employee a sense of security against injury and time lost from work, and add to the pride of the employee in his job and in his company. The management of any plant should be vitally interested in accident prevention as a major factor in developing company loyalty.

Safety Improves Plant Housekeeping

Any sound safety program lays stress on good housekeeping. A trim and orderly plant, everyone will agree, is both safer and more efficient. And, where attention has been given to safety, you can count on improved appearance, with a place for everything and everything in its place.

Safety Aids Efficient Design

Item No. 8, which is the last one in my list of production benefits gained through safety engineering, is: Assistance in designing more productive equipment and in laying out more efficient plants. No one will dispute the point that proper ventilation, which carries off fumes, not only makes a work place safer but also helps production. The substitution of a stairway for a ladder increases safety. It also provides for quicker, more economical movement of employees. A plant that is laid out with wide aisles for safer movement of materials is more efficient because it is

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Horse sense about **ATHLETE'S FOOT**

91 skin specialists condemn old-fashioned foot baths as being "illogical and potentially harmful to the skin."
(*Archives of Dermatology and Syphilology for April, 1942.*)

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possible to move materials with a minimum of interference. Power presses that have been provided with guards and automatic feeds to increase the safety of the operation also give better production. The replacement of heavy hand lifting with mechanical-handling equipment both eliminates strains and increases the facility of materials handling. Recently, in our own plants, we increased the size of our rolls of fabric and because of the additional strain that would be placed on the employee in handling them, we decided to have special trucks built for the purpose. We now find that we have not only eliminated the strain hazard to employees but have increased our efficiency in handling rolls. Many famous developments, such as the Westinghouse air brake, were originated principally for safety purposes but have contributed greatly to efficiency of operation.

Management should know that the fruits of an accident prevention program are many and varied. Accident prevention is not window dressing. It is, in the very nature of things, an integral part of production. This seems very elementary but a great deal of confusion could be avoided if all safety personnel, and all managements, recognized that safety "belongs" and is not a luxury to be indulged in only during prosperous times.

Making the Program Effective

To make a safety program most effective, safety engineers must alternate in their approach—that is, first turn to top management and sell the program; then turn to the organization and put it into effect.

It is my feeling that the most effective way for a safety engineer to work is to help supervision in its accident prevention activities. To do a good job, a safety engineer must be a person who is well-versed in the problems of human relations and in understanding people. His effectiveness in creating enthusiasm for safety among workers and in getting the supervision of operating departments to realize its responsibility for safety will depend to a great extent on his ability to secure the cooperation of both supervision and workers. His personality must be one that invites the wholehearted cooperation of all members of the organization. He should sell himself to an extent that the employees and supervisors alike will be glad to see him and will want to help him in his accident prevention efforts. One good measure of his success in this respect is the number of times supervisors seek him out and ask for his advice. Only very infrequently, if ever, should it be necessary for the safety engineer to go to the top management official to have him bring pressure on some uncooperative foreman or department manager.

A safety program is a team project. The safety engineer might be classed as the quarterback of the

Safety in Portland

REPRESENTATIVES from Portland cement mills and quarries in southern California attended one of a nation-wide series of cement industry safety meetings at the Hotel Biltmore in Los Angeles on January 31. This meeting was the first of 21 regional meetings at which 63 Portland cement plants throughout the United States and Canada will be represented. The final meeting of the series will be held at Petoskey, Mich., May 16. These meetings are sponsored by the Portland Cement Association.

L. E. Bancroft, vice president and general manager of the California Portland Cement Co., Colton, Calif., was general chairman of the Los Angeles meeting. George E. Warren, president of the Southwestern Portland Cement Co., presided at the luncheon session of the conference.

Guests and special speakers included state and local officials active in promoting industrial safety together with local engineers of the United States Bureau of Mines,

Cement Industry

and A. J. R. Curtis, Chicago, safety director, Portland Cement Association.

The program included an analysis of cement mill accidents of 1949 and their causes as a part of a renewed drive to prevent disabling injuries and maintain the cement industry's position as one of the safest in the nation. Proposed methods for the complete elimination of these accidents and injuries were discussed. Attention was also given to safe driving, the industry's safety program including accident prevention and health promotion at home and on the streets as well as on the job. The motion picture, "The Drama of Portland Cement" in color and sound was shown, augmented with slide films on accident prevention in mills and quarries.

Those attending included plant managers, cement mill superintendents, safety directors, plant department foremen, quarry foremen and members of plant safety committees.

team. It is the job of the safety engineer to call the signals, to block and let the foreman carry the ball, and to coordinate team efforts. Never should a safety engineer be like a quarterback who does very little blocking but who sees to it that he carries the ball, particularly when his team has the ball near the opposing team's goal line —the kind of a fellow who likes the glory but who is unwilling to do the hard work. Such a quarterback is soon replaced.

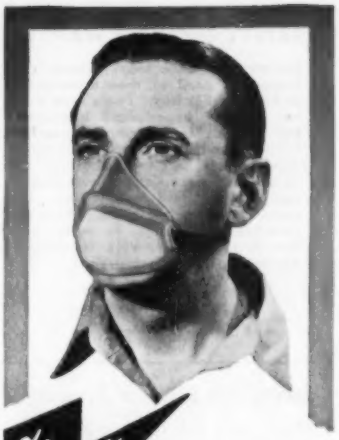
A good quarterback or a good safety engineer must be willing to do more than his share of the work and often must be content to take a back seat and give the credit for jobs well done to others. Certainly there is no limit to what a man can do if he is not too much concerned about who gets the glory. The effectiveness of one's work depends upon the whole-hearted cooperation of the men who must implement the programs. Try to develop ideas and sell them in such a way that members of supervision will accept them as their own or will have a sense of participation in their origin. The safety engineer should not hesitate to accept a suggested way to do a job which may not be his way, but which still will be just as good. The end is the same and the result will be better because he will secure increased cooperation from the other person.

As in most any other kind of work, the results are pretty much determined by the effort that is put forth. We know that accidents cannot be stopped by knocking on wood, by waiting and hoping for lucky days, nor by quiet whisperings of fear lest some dire calamity fall upon us. We cannot expect to have a good safety record unless we work for it.

Another suggestion is that one should make continued use of new ideas. Even if the safety engineer has to copy one from someone else, it will be new to his people. Above all, he must keep out of a rut and continue to add to his safety program. He must always keep a learner's attitude.

New Employees

When we tell the human story of safety to our employees, let's be absolutely sure that it is understood. Too many of us take too much for granted. The thing that is perfectly obvious to us may not be nearly so clear to the one who needs it most. We must remember that new employees are coming into our plants each year and are hearing the industrial safety message for the first time. This point is well illustrated by the story of the two million Americans who never saw an elephant. In reading the advertisement of the circus coming to town, we are inclined to say, "Same old stuff, same old animals, same stunts, and same ballyhoo." We do not realize that between the time we saw the elephant last year and the time he again visits our city, more than two million new Americans have arrived *(To next page)*



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SAFETY ENGINEERING,
75 Fulton St., New York 7.

Safety Not Window Dressing

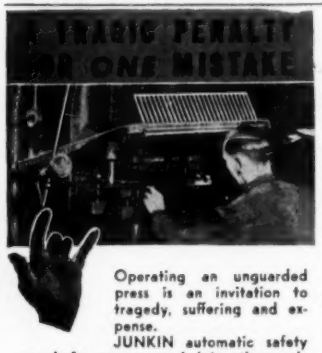
(From page 43) in this old world. Every year over two million babies are born. Every year some portion of those annual groups of two million youngsters go to a circus for the first time.

The audience in safety is not stationary but is changing all the time. Safety engineers are not talking or playing to a grandstand seated crowd but to a parade always on the move, continually bringing new eyes and ears into the audience. To some the safety story may be familiar, but to others, what they have to say is as interesting as an elephant to the kid who never saw one.

Safety engineers should not become discouraged. When their companies seem to be having a large number of accidents and nothing seems to go right, they must keep plugging away at their work. The stone cutter may hammer away at his rock, perhaps 100 times, without so much as a crack showing in it. Yet, at the 101st blow it will split in two. It was not the last blow that did the job but all that had gone before it. In short, the task ahead of one is never as great as the power behind him.

Unfortunately, the positive results of the efforts of a safety engineer cannot be measured with scientific accuracy. There is no way of calculating positively the accidents which were prevented through his efforts. In most fields of endeavor we have both a positive and a negative measure of effectiveness. In baseball, the fielding skill of the player is measured both by his assists and put-outs and by his errors. At bat, his hits can be counted as well as the times he failed to hit. This is not true of safety. The death of an employee as a result of an accident is news. The saving of thousands of lives and the increase in production efficiency as a result of accident prevention efforts are not headline stories. But, fortunately, safety engineers do not look for their reward in the newspapers. They should always remember that in safety they protect, not a camera, but a human eye; not a pump, but the human heart; not a compressor, but the human lung; not oil and grease, but human blood. They protect the most important machine in the world, the human body. Their reward as safety engineers is the well-being of all the people who come within the scope of their efforts.

From an address presented at the 1949 Annual Meeting of the American Society of Safety Engineers.



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JUNKIN SAFETY APPLIANCE Co., Inc.
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JUNKIN SAFETY GUARD

N. Y. Safety Convention Set for March

A MAJOR conference for the purpose of reducing accidents of all kinds throughout the nation will be held here during the last four days of March. Harold K. Kramer, president of the Greater New York Safety Council, announced recently that two hundred safety experts from many parts of the country would address the fifty sessions of New York's 20th annual Safety Convention and Exposition to be held at the Statler and Governor Clinton Hotels, starting Mar. 28.

The convention, which draws an annual attendance of 10,000 to 12,000 persons, is sponsored by the Greater New York Safety Council with the assistance of sixty national and local co-operating agencies, including the Red Cross, Army, Navy, Coast Guard, traffic and law enforcement agencies, local safety councils, chambers of commerce, insurance associations, city departments, industrial management and civic organizations. Dr. Walter A. Cutter, Administrative Assistant at the New York University Center for Safety Education, is general chairman for the convention and exposition.

There will be at least two "firsts" this year, Dr. Cutter declared. Because of many requests from the motorboating and sailing public, the convention will have its first night session on boat handling and safety afloat. Arranged by the Coast Guard, the boating session will be addressed also by safety experts from the Coast Guard Auxiliary and the U.S. Power Squadrons. At the request of the leather industry a session will be devoted for the first time to accident reduction in the tanning trades. Both of these sessions will be on Mar. 28.

The latest techniques in accident prevention and methods of education in safety in the home, industry, traffic and all other fields will be discussed and prepared papers will be delivered by authorities from most of the states of the union.

"SAFETY OSCAR"

A RECORD of more than 2,600,000 man-hours of work without a single lost-time accident recently earned 425 Westinghouse Electric Corporation employees a "Safety Oscar" in honor of their achievement.

W. A. Beatty, manager of the Westinghouse Feeder Division, presented the trophy to the employees in the tool and special equipment department of the Division at the company's East Pittsburgh Works. He pointed out that nearly three years have elapsed since a lost-time accident occurred in the department on April 17, 1947.

Paul M. Matthews, superintendent of the department, who accepted the award on behalf of the employees, attributed the record performance to group cooperation and a streamlined safety program.

"Only the daily cooperation of every employee makes an award of this nature possible," Mr. Matthews said. "Accident prevention is an individual responsibility, but no individual can claim complete responsibility for the outstanding record that belongs to this department."

(See editorial—Page 8.)

Mr. Matthews pointed out that the work carried on in the department requires virtually every machining function known. Employees build tools, testing devices, jigs, new machinery, dies, and repair or rebuild machinery from other departments in the plant.

"With such varied operations, extremely hazardous conditions might easily arise," he said, "if it were not for our employees' continued observance of the safety program and the safety rules."

SURESEAL PK GLOVES
WITH GRIPTITE FINISH

GLOVE COST ~~$9.90~~ 60¢

In a tough, on-the-job test, one manufacturer found that Sureseal PK Gloves with Griptite Finish wore 18 times longer, handled 18 times as many pieces, as good hot mill gloves heavily wrapped with friction tape. 18 pairs of hot mill gloves (plus friction tape) were costing the manufacturer $9.90. He got the same amount of service from one pair of Sureseal PK gloves costing 60¢, a savings of 93%.

Sureseal PK Coated Gloves with non-slip Griptite Finish can turn in some nice savings for you, too.

For details write: Dept. E

THE SURETY RUBBER CO. CARROLLTON, OHIO

New Book on Research

OVER 4000 current college and university research projects, in engineering subjects, representing expenditures of over $35,000,000 are listed by title in the 1949 *Review of Current Research*, published recently by the Engineering College Research Council of the American Society for Engineering Education.

Entries in the book from 82 educational institutions which hold membership in the Research Council describe the administrative policies for conducting engineering research and list the responsible personnel, research expenditures, short courses and conferences of special interest, and the titles of all engineering research studies currently active at each institution.

Use of the volume is facilitated by a breakdown of research projects according to the engineering departments involved, and by a complete index to research project subjects.

Copies of the book, paper bound and including more than 180 pages, are available ($1.75 postpaid) from the Engineering College Research Council. Address orders to F. M. Dawson, Chairman, in care of the College of Engineering, State University of Iowa, Iowa City, Iowa.

First Aid Equipment

(From page 19) so constructed that they deliver only a drop or two of antiseptic at a time and thus can be applied without an applicator and absorbent cotton.

Many physicians advise that for tiny wounds no antiseptic be applied. They prefer that the wound be carefully washed and a sterile dressing applied. With larger wounds, physicians frequently prefer that the only first aid be the application of a dressing.

The principal ingredients of most burn ointments are an oily or greasy base and a local anesthetic. There are various burn ointments on the market containing good local anesthetics. Two tubes containing one or two ounces each should be sufficient for the small plant. It is generally advised that the use of burn ointment be confined to first degree burns.

Splints

Small plant first aid equipment

should be sufficient to care for major as well as minor injuries. Many small plants are provided with only a small first aid kit and are not equipped to care for really serious injuries. Triangular bandages in quantity, splints, stretchers and blankets are often needed for major injuries. In some plants employees may be prohibited from splinting fractures. In such cases it is generally assumed that a physician or an ambulance will soon be at hand. However, even in these cases a supply of splints should be on hand as the physician's work will be greatly facilitated if he is able to select splints of proper size from the plant's stock. Splints can be purchased commercially or they can be made very easily. The following stock is suggested:

2 arm splints, 3″ x 17″ and from ⅛″ to ¼″ thick

2 leg splints, 3½″ x 30″ and from ⅜″ to ½″ thick

2 thigh splints, 3½″ x 54″ and from ⅜″ to ½″ thick

If a victim must be transported for a long distance and will remain splinted for a considerable period of time a half-ring traction splint for the lower extremity is strongly recommended provided it is applied by persons well trained in proper first aid procedures.

Stretcher and Blanket

A standard collapsible stretcher is very important for good transportation of injured people. A stretcher can be used quite easily even for transportation in standard passenger automobiles. First aid equipment may include a complete stretcher or two stretcher poles with a blanket being utilized to complete the building of the stretcher.

Additional Equipment

Most small plants will have on call the services of one or two local physicians. Therefore, it is suggested that the additional equipment shown in Table 1 be stored in a room set aside for first aid purposes or in a well constructed cabinet so that these supplies may be available for the physician's use on the spot:

First aid equipment for workers assigned to motor vehicles. It is most important that personnel whose main work is outside the plant proper and often assigned to remote areas be equipped with a minimum amount of first aid materials. Commercial first aid kits are usually designed in units of 8, 16 and 24. It is strongly recommended that each motor vehicle be equipped with at least a 24-unit first aid kit. The units should consist of the items in Table 2.

Additional equipment such as blankets, splint, fire extinguisher, flare and flashlight is strongly recommended.

Pictures by courtesy of the American Red Cross.

TABLE 1

Absorbent cotton	Kidney basin
50–70 percent alcohol solution	Medicine droppers
Applicators	Medicine glasses
Benzine with mineral oil, 3 to 1	Oil of cloves
Bicarbonate of soda	Paper and cloth towels
Boric acid crystals	Paper handkerchiefs
Container for heating water	Safety pins
Containers for soap solution, for dressings, and for cotton	Salt
Dressing forceps	Soap solution
Epsom salts	Spoons
Eyecups	Tongue depressors
Flashlight	Thermometers
Heating unit	Washbasin

TABLE 2

1″ adhesive compresses, 2 packages, 16 per package
2″ bandage compresses, 2 packages, 4 per package
3″ bandage compresses, 2 packages, 2 per package
4″ bandage compresses, 1 package
3″ x 3″ plain gauze pads, 1 package, 4 per package
2″ x 6 yds. gauze roller bandage, 2 packages, 3 per package
burn ointment, 1 package, 2 tubes per package
plain absorbent gauze, ½ sq. yd., 3 packages, 2 pieces per package
plain absorbent gauze, 1 sq. yd., 2 packages, 1 per package
caster oil, 1 package, 4 tubes per package
antiseptic vials (10 cc.), 1 package, 3 vials per package
2 packages 40″ triangular bandage, 1 per package
1 package 40″ triangular bandage with tweezers and scissors
Total—24 units.

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BUFFALO 11, N. Y.

Rules for Power Trucks

(From page 17) before an attempt is made to start the engine.)

d. Contact shall be maintained between the tank fill connection on the industrial power truck and the refueling hose nozzle or safety can spout to prevent the accumulation of dangerous charges of static electricity.

Battery Charging and Changing Facilities.

a. Battery charging installations should be located in areas designated for that purpose. Provision should be made for flushing and neutralizing spillage, for fire protection, and for protection of the charging apparatus from being bumped by trucks.

b. To avoid strains from manual handling of heavy or awkward loads, a roller conveyor and/or a suitable overhead hoist, or equivalent material handling equipment, should be provided.

c. Electrical apparatus installations shall conform to the governing code of the locality, and at least conform to the National Electrical Code (ASA C1-1946).

d. The truck shall be properly positioned and the brakes set before attempting to change or charge a battery.

e. All battery changing and charging operations shall be performed by trained and properly authorized personnel. (Truck operators may or may not be so authorized, depending upon individual plant set-ups.)

f. Battery terminals shall be clean, connections tight, and the battery properly positioned in the truck and securely locked in place.

Explosive Atmospheres. Industrial trucks electrically or gasoline powered shall not be used in atmospheres containing flammable gases or vapors, combustible dusts, or easily ignitible fibers, unless specifically approved by the inspection authority for the location involved.

Marking of Aisles and Obstructions. Whenever aisles, roadways, or passageways are marked or defined, it is recommended that the suggestions contained in the American Standard Safety Color Code (ASA Z53.1-1945) be followed.

Bridge Plates.

a. Bridge plates shall be strong enough to carry the load imposed on them. The carrying capacity should be plainly marked on the bridge plate.

b. They shall be secured in position, either by being anchored down or equipped with devices which will prevent their slipping or sliding away.

c. Hand holds, or other effective means, shall be provided on bridge plates to assist or permit handling them in safety. Where practicable, fork loops or lugs should be fitted to the bridge plate for handling them by fork trucks.

d. Bridge plates should have a high friction surface, designed to prevent employees or trucks from slipping on them.

e. Bridge plates should be designed and maintained so that when they are in the secure position the end edges will have a substantial contact with the dock (or loading platform) and the carrier so as to prevent the plate from rocking or sliding when it is being used.

f. The sides of the bridge plates should be turned up at right angles, or other means provided, to prevent trucks from running over the edge.

g. Positive protection should be provided to prevent railroad cars from being moved by engines or car pullers while bridge plates are in position and men are working across them. Local railroad authorities should be consulted on proper warning device to use.

Paint Color. It is suggested that industrial power trucks be painted a color which will comply with the American Standard Safety Color Code (Z53.1).

Lighting for Operating Areas.

a. Controlled lighting of adequate intensity should be provided in operating areas. (See American

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Handrails of steel guard the large roomy platform for added safety. Half of platform can be raised to form an extra step, when needed. These famous ladders can be set up instantly, are easy to carry and fold compactly for storing. Automatic locking feature insures safety while ladder is in use.

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DAYTON SAFETY LADDER CO.

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In Canada—Safety Supply Company—Toronto

Recommended Practice of Industrial Lighting, ASA A11-1942.)

b. Where general lighting is less than 2 foot-candles, auxiliary directional lighting shall be provided on the truck.

Control of Obnoxious Gases and Fumes.

a. Concentration levels of carbon monoxide gas created by industrial power truck operations should not exceed those specified by local, state, or municipal codes, but in no event shall they be higher than the levels specified in American Standard Allowable Concentration of Carbon Monoxide (ASA Z37.1-1941).

b. Questions concerning degree of concentration and methods of sampling to ascertain the conditions should be referred to a qualified industrial hygienist.

Maintenance. Trucks should be maintained so as to ensure their being in a safe operating condition at all times. Consideration should be given to the proper functioning of tires, horn, lights, battery, controller, lift system (including forks, chains, cables, and limit switches), brakes, and steering mechanism. It is recommended that a definite procedure be followed to keep trucks in a clean condition to reduce fire hazards. The weight of the truck should be plainly marked in a conspicuous place. No counterweighting should be added to fork trucks to increase their lifting capacity unless approved by the truck manufacturer.

SPECIFIC SAFETY RULES AND REGULATIONS

Industrial power truck operators shall abide by the following rules and regulations:

Traffic Rules

1. Operators shall look in the direction of, and keep a clear view of, the path of travel.

2. They shall operate at an authorized speed but consistent with conditions, always maintaining a safe distance from other vehicles and keeping the truck under control at all times in order to be able to stop in case of emergency.

3. They shall avoid making quick starts, jerky stops, or quick turns, particularly when stacking.

4. Stunt driving and horseplay shall not be permitted.

5. Operators shall slow down for wet and slippery floors.

6. They shall move only loads which are securely and safely loaded.

7. Before driving over a bridge plate, the operator shall be sure that it is properly secured. He shall drive carefully and slowly over the bridge plate.

8. Operators shall safeguard the pedestrian at all times. They shall not drive a truck up to anyone who is standing in front of a bench or other fixed object.

9. They shall not pass another truck traveling in the same direction at intersections, blind spots, or at other dangerous locations.

10. Operators shall not run their vehicles onto any elevator unless specifically authorized to do so. Before entering any elevator, they shall make sure that the capacity of the elevator is not exceeded. They shall approach elevator slowly, stop at a safe distance from the elevator gate, and then enter squarely. Once on elevator, they shall neutralize the controls, shut off power, and set brakes.

11. Operators shall slow down at cross aisles, and when vision is obstructed by doors, corners, and elevators. They shall keep to the right.

12. They shall avoid running over loose objects on the roadway surface.

Motor and Fuel Rules

13. When leaving an industrial power truck unattended, controls shall be neutralized, power shut off, brakes set, key or pull connector plug removed, and forks left in a down position.

14. Operators shall avoid the accumulation of fumes and gases caused by long periods of idling of gasoline engines in enclosed or semi-enclosed areas.

15. Fuel tanks shall never be filled while motor is running.

16. Any spillage of oil or gasoline shall be carefully washed away or completely evaporated and gasoline tank cap replaced before restarting motor.

NOTE: Care must always be taken to avoid spillage.

Rules on Other Personnel

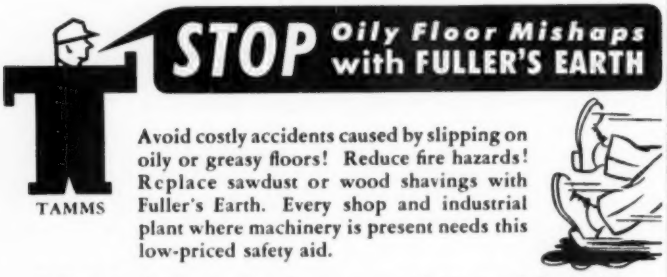
17. Unauthorized passengers shall not be permitted to ride on industrial power trucks.

18. When a fork truck is used to elevate anyone, a suitable platform securely fastened to the works shall be provided.

19. No one shall be allowed to stand or walk under elevated forks.

Repair Rules

20. If at any time an industrial power truck is found to be out of repair, defective, or in any way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unsafe, the matter shall be reported immediately to the designated authority, and no one shall again operate the truck until it has been made safe. Special consideration shall be given to the proper functioning of tires, horn, lights, battery, controller, lift system (including forks, chains, cable, and limit switches), brakes, and steering mechanism.

21. Open flames shall never be used for checking water level in storage batteries. A safety light shall be used where necessary.

22. Operators shall not make any repairs or adjustments unless specifically authorized to do so.

Loading and Operating Rules

23. They shall observe designated load capacity of truck. No counterweighting shall be added to fork trucks to increase lifting capacity. Extreme care shall be used when tilting load forward or backward particularly when high tiering.

24. Industrial power trucks, while being operated on any elevated dock or platform above the track level, shall never be used to tow or push freight cars.

25. Operators shall cross railroad tracks diagonally wherever possible. They shall not park closer than 8 ft. from railroad tracks.

26. Operators shall never put their arms or legs between the uprights of the mast or outside the running lines of the truck.

27. They shall give the right of way to ambulances, fire trucks, or other vehicles in emergency situations. Fire aisles, access to stairways, and fire equipment shall be kept clear.

28. A truck shall never be left on an incline unless the brakes are set and the wheels are properly blocked.

29. All types of loaded lift trucks shall be driven downgrade with the load last and upgrade with the load first. On descending grades, the truck shall be kept under control so that it can be brought to an emergency stop in the clear space in front of the truck. On all grades, the mast shall be tilted back and the forks raised as far as necessary to clear the road surface.

30. Forks shall always be placed under the load, as far as possible, and the mast tilted backward to cradle the load.

31. The load shall be carried as low as possible, consistent with safe operation. When a fork truck is empty, the operator shall travel with the forks as low as possible while conforming to local conditions.

32. When loading or unloading highway trucks, trailers, or railroad cars, their brakes must be set or their wheels blocked in a manner that will hold them securely in place.

33. When a powered hand truck is operated by a walking operator (not riding) the truck must be backed onto an elevator to eliminate the chance of the operator being caught between the handle of the machine and the wall of the elevator car.

34. Operators shall avoid striking sprinkler heads, pipes, elevator gates, walls, columns, fire doors, and other obstructions.

35. They shall be certain that all accidents to persons or property are reported promptly to their foreman or supervisor.

By following the above rules, factories using industrial power trucks should be able to keep their in-plant traffic accidents to a minimum. There is little real excuse for our public highway accident toll, but there is even less reason for alibiing industrial trucking accidents. The ultimate solution lies in education and enforcement, and in the above rules and recommendations will be found the tools for making truck operators safety conscious.

The tentative "Safety Code for Industrial Power Trucks" is available from the American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y.

Pictures on page 16: Top and Bottom by courtesy of Yale & Towne Mfg. Co.; Center by courtesy of Towmotor Corp.

"Know-how" gained in serving industry nationwide enables Marsh & McLennan engineers to contribute much toward the conservation of human life, industrial health and property.

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New Type Brakes for Industry

Frank Eubank, maintenance superintendent for the Old Ben Coal Corporation, is shown with a shuttle car equipped with the airplane-type, single disc industrial brake. Eubank supervised a test program conducted in his company's West Frankfort, Illinois mine, which revealed that shuttle operation maintenance costs were cut more than half when the new type brakes were installed on the mine's shuttle equipment.

A REVOLUTIONARY industrial brake, adapted from an airplane-type, single disc brake, lowered maintenance costs on shuttle cars during a one-year testing program in a southern Illinois mine by more than 50 per cent.

In disclosing results of the development program, which lowered the mine's shuttle car down time by more than one-half in a year, Frank Eubanks, maintenance superintendent for the mining company, said: "The airplane-type brake is the greatest contribution yet made to shuttle car and loading machine mine operations."

According to records kept by Eubanks on the test car, 96,131.71 tons of coal were hauled in the car in less than a year without a brake failure. Since installation of the test model brake, other sets of single disc brakes are being installed on all of the mine's shuttle equipment.

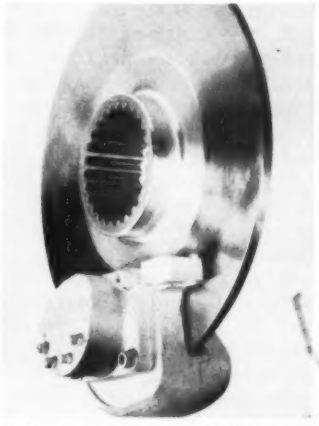
The Joy company, one of the leading manufacturers of mining equipment, is installing the single disc brake on all its new shuttle cars, continuous miner and some loading machine models. The brake is also available for installation on older model machines now in service in the field.

"After application of this airplane brake, down time because of brake failures on our shuttle operation equipment has been decreased by more than 80 percent and production has been increased materially as a result," Eubanks declared. Developed under the direction of C. A. Hulsemann, the non self-energizing brake gives a soft-cushion braking action in contrast to quick-grabbing action of conventional types. The brake has a straight line torque curve throughout braking range and gives equal torque in both directions. It is simply constructed, easy to reline or replace and is self-adjusting over the entire life of the lining. Self-adjusting feature enables operators to enjoy a permanent pedal stroke at all times.

Engineers and design experts have adapted the airplane-type brake to many types of mining equipment, namely: shuttle cars, continuous miners, loading machines and timber setters. Installations have also been made on high-speed band saws, large radar antenna scopes and huge press brakes for shaping metal with marked success.

Engineers are designing single disc brakes for prospective applications on mine locomotives, mine slushers, post pullers, portable oil well drilling rigs, iron ore tram cars, auxiliary brakes for giant earthmoving units, cross-country trucks and buses and many other heavy industrial machines.

Pictures by courtesy of the Goodyear Tire & Rubber Co.



Airplane-type single disc industrial brake has simple construction. Other features include non self-energizing action and self-adjustment.

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and in Industrial BURN CASES use
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Dionol Ointments melt at body temperature for almost immediate effectiveness.

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Safety in the Oil Industry

THE publication of a comprehensive manual of refinery safety information was announced recently by Mr. Fred O. Clark, President of John G. Simmonds & Co., Inc., oil insurance underwriters of New York City. Entitled "Safety in the Petroleum Refining and Related Industries," the publication comprises approximately 425 pages containing 238 photographs, charts, flow diagrams and other illustrations. The book was prepared for John G. Simmonds & Co., Inc. by George Armistead, Jr., Consulting Chemical Engineer of Washington, D. C. The author has long been associated with refinery safety work and prepared one of the first widely distributed safety inspection manuals for Gasoline Products Company, Inc. in 1938.

"Our company has felt for a long time," stated Mr. Clark, "that the particular problems in fire and explosion prevention in the petroleum and related industries justified some compilation of industry-wide data on accepted practices, equipment standards, inspection methods and other features which are vital to safe operation. Many companies have studied fire and accident prevention in detail from various standpoints and we felt that the literature of the petroleum industry was somewhat lacking in not having a full presentation of the subject. We regard the *prevention* of fires, explosions and other accidents as the primary goal rather than fire extinguishment and other remedial measures. It has been our objective to cover the safety field for the petroleum refining industry and related sections of the chemical industry. Naturally, a publication devoted to so broad a scope cannot be complete in only 425 pages, but we hope it may serve as a basis for revision and amplification in later editions. As we have pointed out in the book, the presentation is designed to be useful to the widest number of persons in the petroleum refining and related industries and we hope it will be widely read and referred to, but it is not the basis of any insurance rating schedule."

"Safety in the Petroleum Refining and Related Industries" is composed of twelve chapters with eight appendices, the titles of which are as follows:

Principles of Safety
Fundamentals
Plant Layout
The Fire Protection of Structures
Mechanical Standards for Construction and Maintenance
Operating Practices Affecting Safety
Relief and Blowdown Systems for Process Units
Storage Tanks
Maintenance Practices Affecting Safety
Static Electricity and Other Ignition Sources
Outline of Inspection Practices
Fire Control and Extinguishment
Properties of Flammable Gases, Liquids and Solids
Table of Common Hazardous Chemicals
Guide to the Corrosion Resistant Properties of Construction Materials
Specifications for Reinforced Concrete Fire Protective Insulation
Specifications for Brick Fire Protective Insulation
Inspection Tools, Devices and Equipment
Retiring Thicknesses for Tubes in Fired Heaters
Retiring Thicknesses for Piping.

Safety Investment

The various aspects of safety have been extensively illustrated by examples with the liberal use of photographs, drawings and flow diagrams. On the subject of fireproofing insulation, for example, instances of localized heating effects on steelwork and the failures of

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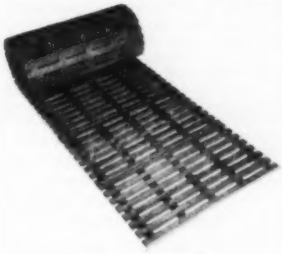

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Crews of the Pennsylvania Railroad wreck trains throughout the road's thirty-three divisions have been trained in the use of new type oxygen breathing apparatus to aid them in emergency work and during maintenance and repair operations in areas where oxygen supplies are deficient or where poisonous or suffocating gases may exist. The apparatus generates its own oxygen and provides at least 45-minutes protection for the wearer in unbreathable atmospheres. Because the equipment weighs only 13½ pounds and requires no outside hose line connections or high pressure cylinders, the wearer is permitted freedom of movement to a very high degree. The Pennsylvania Railroad has installed three of these devices on each wreck train, except those operating in tunnel territories which are equipped with double that number.

Picture by courtesy of Mine Safety Appliances Co.

certain types of insulation are shown and specifications are given for acceptable insulation methods. On the subject of inspection, photographs and charts illustrate the extent of variation of corrosion under various conditions, which the safety inspector must locate and measure. Strong recommendation of the use of modern non-destructive inspection instruments is made. In the section on relief valves and blowdown facilities, it is pointed out that the mere provision of relief valves is not full assurance of safety for vessels and other equipment under certain emergency conditions, but that remotely operated shutdown and dumping provisions may also be required, acceptable practice for which is outlined.

An interesting feature of the presentation in the first chapter of the book relates to general safety policies and the cost of maintaining maximum safety, both with regard to investment and continuing costs. Figures are presented to show that with the maximum feasible provision of safety equipment, a typical 25,000 BPCD complete refinery would cost approximately 5% more than with the bare minimum of provisions which are almost always provided. It is estimated that the continuing cost of activities chargeable to safety, but actually including some items normally incurred for maintenance purposes, is of the order of 5% of total operating costs of the typical refinery.

The extensive tabulations given in the appendix show, among other things, detailed properties of 323 flammable liquids, vapors and solids, and of 115 common hazardous chemicals, and there are 24 pages of tabulation of allowable operating pressures for various sizes of piping and heater tubes under a wide range of temperatures and thickness.

Mr. Clark stated that the publication was prepared primarily as a service for the refiners whose insurance is carried by his organization, but copies may be secured by others at a price of $10 each.

EVER-KLEAR COVER LENS

TWENTY YEARS OF PROVEN SERVICE

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Comfortable Vision

Is what EVER-KLEAR Cover Lens gives you.
You can't do your best welding unless your vision is clear and comfortable. Thousands have found this to be true after using EVER-KLEAR Cover Lens. They give a keen sharp view of the weld always. They do not pit.

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Sizes 46½ to 50 M.M., for goggles ..... .35 per pair

Contact your nearest Jobber. If they cannot supply you, send order direct, giving Jobber's name.

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405 PENN AVENUE ROOM 803 PITTSBURGH 22, PA.

Ansul Chemical Co. Elects Directors

ANSUL Chemical Company, manufacturers of dry chemical fire extinguishers and industrial and refrigeration chemicals, announced recently the election of four new directors. They are Leonard C. McKesson, vice-president in charge of sales; Arthur C. Pope, vice-president in charge of manufacturing; Stanley R. Holmquist, treasurer, and A. J. Whitford, President of the First National Bank of Marinette, Wisconsin. Mr. Whitford's election marks his first business connection with Ansul, which has its factory in Marinette and sales branches in the principal cities of the United States.

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An international committee of judges based its decisions on the scrapbooks, clippings, photographs, records and motion picture evidence of activities during Fire Prevention Week, October 9–15 and Spring Clean-up Week.

Memphis was chosen first for its extensive work in every phase of community activity. Mr. Fleming said that the judges felt its report showed "a complete all-round program involving features which might influence fire prevention and protection on a permanent basis. It shows results in the reduction of first losses which is the cumulative effect of an educational campaign."

I KNOW I'M SAFE...
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Heat resistant wooden soles
Strong steel toe
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No. 304-S
Wear a Reece "Strong Toe." Comfortable leather uppers. High, roomy steel toe protector, heat-resistant wooden sole. Have comfort-safe feet at work in oil refineries, foundries, steel mills, factories.
...FOR THE FOUNDRY
No. 300
The Reece "Hot Foot" sandals. Protect your feet in furnace and coke oven rooms. Straps on over your own shoes. Heat resistant wooden sole, strong galvanized iron counter, flexible hinge toe. Cannot slip.
BE SAFE THE REECE WAY... WITH A REECE "HOT FOOT" SANDAL!
There is no substitute for Reece Wooden soles
REECE WOODEN SOLE SHOE CO.
Dept. SE-2
Columbus, Nebraska

Personnel Problems

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He also proposed that supervisors be given proper training in human relations as well as in teaching an employee a job, so that they will be equipped to persuade the employee to give his cooperation in a plant-wide program.

Mr. Smith also pointed out to management that trained men produce more safely and efficiently and efficiency lowers overhead, permitting reductions in operational cost, an important factor in today's keen competition for business.

The Safety-Wise Keep Up on the New Safety Products See pages 68–71

Crews of the Pennsylvania Railroad wreck trains throughout the road's thirty-three divisions have been trained in the use of new type oxygen breathing apparatus to aid them in emergency work and during maintenance and repair operations in areas where oxygen supplies are deficient or where poisonous or suffocating gases may exist. The apparatus generates its own oxygen and provides at least 45-minutes protection for the wearer in unbreathable atmospheres. Because the equipment weighs only 13½ pounds and requires no outside hose line connections or high pressure cylinders, the wearer is permitted freedom of movement to a very high degree. The Pennsylvania Railroad has installed three of these devices on each wreck train, except those operating in tunnel territories which are equipped with double that number.

Picture by courtesy of Mine Safety Appliances Co.

certain types of insulation are shown and specifications are given for acceptable insulation methods. On the subject of inspection, photographs and charts illustrate the extent of variation of corrosion under various conditions, which the safety inspector must locate and measure. Strong recommendation of the use of modern non-destructive inspection instruments is made. In the section on relief valves and blowdown facilities, it is pointed out that the mere provision of relief valves is not full assurance of safety for vessels and other equipment under certain emergency conditions, but that remotely operated shutdown and dumping provisions may also be required, acceptable practice for which is outlined.

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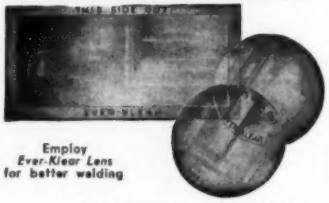

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Fire Prevention Winners

THE city of Memphis, Tenn., was chosen from 3,762 American and Canadian municipalities, fire departments and military establishments as winner of the annual National Fire Prevention Week contest, it was announced in New York recently.

Sponsored for the 26th year by the National Board of Fire Underwriters and the National Fire Protection Association to judge the fire-safety efforts of cities and industries during the annual National Fire Prevention Week in October, the competition was broadened this year for the first time to include U. S. Army, Navy and Air Force bases. Of the 3,761 entries, 2,608 were from United States municipalities, 648 from Canadian cities, 34 from industrial plants in the United States and Canada, 194 Army, 252 Navy, and 26 Air Force bases, with reports coming from as far as Saudi Arabia.

Second and third places among the U. S. cities went to Atlantic, Iowa, and Ft. Collins, Colo., respectively. The first place winning city in Canada was Arvida, Que., with Ottawa, Ont. in second place.

In the industrial plants division, Delco-Remy Division of General Motors, Anderson, Ind., won first place. For military bases first place was awarded to: Memphis General Depot, U.S.A., Memphis, Tenn., among the Army reports; Naval Supply Annex, Stockton, Calif., for Navy reports; and Tinker Air Force Base, Oklahoma City, Okla., for Air Force entries.

This year's entries were an increase of 834 over last year when Oak Ridge, Tenn., won first place, according to T. Alfred Fleming, director of conservation of the National Board of Fire Underwriters, and chairman of the contest.

Mr. Fleming pointed out that cities of more than a million population have a much harder job to put on demonstrations that will reach their huge numbers of residents. Therefore, he wished especially to commend the cities of Chicago, Ill., and New York, N. Y., for their efforts. Both placed among the ten highest entries. Reports were marked according to a point system for their activities and the actual reduction in fires that resulted from them.

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I KNOW I'M SAFE...
with WOODEN SOLES!
Heat resistant wooden soles
Strong steel toe
FOR THE FACTORY...
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Wear a Reece "Strong Toe." Comfortable leather uppers. High, roomy steel toe protector, heat-resistant wooden sole. Have comfort-safe feet at work in oil refineries, foundries, steel mills, factories.
SAFETY STEEL TOE
...FOR THE FOUNDRY
No. 309
The Reece "Hot Foot" sandals. Protect your feet in furnace and coke oven rooms. Straps on over your own shoes. Heat resistant wooden sole, strong galvanized iron counter, flexible hinge toe. Cannot slip.
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The Safety-Wise Keep Up on the New Safety Products See pages 68–71

THE Future SHOWS

Memphis, Tenn.

Eleventh Annual Southern Safety Conference, March 5–7. Braxton Carr, secretary-treasurer, 2120 First Ave. N., Birmingham 3, Ala.

Philadelphia, Pa.

Sixteenth Annual Philadelphia Regional Safety Conference and Exhibit, March 7–8. (Bellevue-Stratford Hotel). Walter W. Matthews, managing director, Philadelphia Safety Conference, N. E. Cor. 17th & Sansom Sts., Philadelphia 3, Pa.

Boston, Mass.

Twenty-ninth Annual Massachusetts Safety Conference & Exposition, March 20–21. (Hotel Statler). Edgar F. Copell, president-director, Mass. Safety Council, 31 State St., Boston 9, Mass.

Safety and Service Emblems

Fewer accidents mean more man-power. Safety Emblems for various lengths of "no lost time" service instill the competitive spirit so necessary for employee cooperation.

Service Award Emblems for 1, 3, 5, 10, 25 and 50 years of continued employment, increase loyalty and reduce labor turnover.

Easily seen and readily recognized emblems such as those illustrated above are paying big dividends in many large plants. Also Identification Badges, Plaques, Athletic Medals, Trophies, etc.

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METAL ARTS CO., Inc.
Dept. 13 Rochester 5, N. Y.

Miami Beach, Fla.

National Society for the Prevention of Blindness Conference, March 26–30. (Floridian Hotel). National Society for the Prevention of Blindness, 1790 Broadway, New York 19, N. Y.

New York, N.Y.

Twentieth Annual Greater New York Safety Convention & Exposition, March 28–31. (Hotel Statler). Paul F. Stricker, Executive Vice-President, Greater New York Safety Council, 60 E. 42nd St., New York 17, N. Y.

Charleston, W. Va.

Annual West Virginia State-Wide Safety Conference, April 5–8. W. C. Easley, managing director, W. Virginia Safety & Health Council, 316–17 Masonic Bldg., Charleston, W. Va.

Columbus, Ohio

Twentieth All Ohio Safety Congress and Exhibit, April 11–13. (Neil House). James H. Fluker, congress chairman; G. S. Kallenbaugh, congress manager, 65 S. Front St., Columbus 15, Ohio.

Buffalo, N. Y.

Tenth Western New York Safety Conference and Exhibit, April 12–13. (Hotel Statler.)

Bridgeport, Conn.

Fifth Annual Connecticut Industrial Safety Conference, April 13. (Stratfield Hotel). Donald Ackley, manager, G. & O. Manufacturing Co., New Haven, Conn.

St. Louis, Mo.

Central States Safety Conference, April 18–20. (Hotel Jefferson). Reyburn Hoffman, Secretary-Manager, Safety Council of Greater St. Louis, 511 Locust St., St. Louis, Mo.

Chicago, Ill.

Thirty-fifth Annual Convention of American Association of Industrial Physicians and Surgeons, April 23–29. (Hotel Sherman). Dr. Edward C. Holmblad, 28 E. Jackson Blvd., Chicago 4, Ill.

Chicago, Ill.

Annual Conference of American Association of Industrial Nurses, April 23–29. (Hotel Sherman). American Association of Industrial Nurses, Inc., Room 909, 654 Madison Ave., New York 21, N. Y.

Toronto, Ont.

Annual Convention International Accident Prevention Associations, April 24–25. (Royal York Hotel). R. B. Morley, General Manager, International Accident Prevention Associations, Toronto 2, Ont.

Chicago, Ill.

Twenty-seventh Annual Midwest Safety Show, May 2–4. (Hotel Sherman). Joseph F. Stech, Manager, Greater Chicago Safety Council, 10 N. Clark St., Chicago 2, Ill.

Pittsburgh, Pa.

Twenty-fifth Annual Western Pennsylvania Safety Engineering Conference, May 2–4. (William Penn Hotel). H. H. Brainerd, Executive Manager, Western Pennsylvania Safety Council, Chamber of Commerce Bldg., Pittsburgh 19, Pa.

Charlotte, N. C.

Twentieth Annual North Carolina Statewide Industrial Safety

Conference, May 3–5. (Hotel Charlotte). H. S. Baucom, Safety Director, North Carolina Industrial Commission, Raleigh, N. C.

Baltimore, Md.

Maryland State-Wide Safety-Health Conference and Exhibit, May 4–5. (Lord Baltimore Hotel.) Joseph A. Haller, executive chairman, State Industrial Accident Commission, Equitable Bldg., Baltimore 2, Md.

Detroit, Mich.

Twentieth Annual Michigan Safety Conference and Exhibit, May 15–18. (Book Cadillac Hotel). S. M. Foeller, executive secretary, Michigan Consolidated Gas Co., 415 Clifford, Detroit 26, Mich.

Duluth, Minn.

Twenty-sixth Annual Lake Superior Mines Safety Council, May 18–19. (Hotel Duluth). John A. Johnson, supervising engineer, U. S. Bureau of Mines, 18 Federal Bldg., Duluth 2, Minn.

Roanoke, Va.

Sixteenth Annual Virginia State-Wide Safety Conference, June 1–3. (Hotel Roanoke). W. W. Myers, managing director, Richmond Safety Council, Allison Bldg., Richmond 19, Va.

Washington, D. C.

President's Conference on Industrial Safety, June 5–7. (Dept. of Labor Auditorium.) Secretary of Labor Maurice J. Tobin, general chairman of the conference.

Boise, Idaho

Western Safety Conference, June 18–20. L. M. McKay, Vice-President, Western Safety Conference, P.O. Box 1038, Boise, Idaho.

Chicago, Ill.

Thirty-eight Annual National Safety Congress and Exposition, October 16–20. (Stevens Hotel). R. L. Forney, general secretary, National Safety Council, 20 N. Wacker Drive, Chicago 6, Ill.

NOW for a better fit, more comfort, longer wear
NEW, IMPROVED
NEOPRENE
HOOD
INDUSTRIAL
CURVED-FINGER GLOVES!
HOOD has done it again! For years, HOOD gauntlets and knit wrist gloves have been the choice of industry. Today, the new, improved models are ready to provide new comfort and safety for vital hands. Exhaustive tests prove their superior wear! There's ample knuckle allowance! Fingers and thumbs are curved for more efficiency! Gauntlet shown has thumb crotch reinforcement! There are no seams on the working surface! Knit wrists are color fast! Both models are bigger, more flexible! Yes, be sure of new protection, new efficiency with the new, improved HOOD Industrial Gloves. Order from your jobber today!
HOOD for Safety plus
HOOD RUBBER CO.
Watertown, Mass.
DIVISION OF THE B. F. GOODRICH COMPANY

Armco Keeps Its Employees Safe

A SAFETY-TRAINING booklet, 50 pages packed with pictures and written for easy reading, has been published for the use of rail transportation employees of Armco Steel Corporation's Middletown, Ohio Division.

Based on practical experience of railroad men, the booklet gives Armco train crews detailed and illustrated instructions on the right way—the safe way—to perform virtually all of their train-handling duties. Because it is pocket-size, employees can carry the booklet with them for ready reference.

See the Free Bulletins Reviewed on page 67

Management Changes at Buffalo Fire Appliance Corp.

THE Board of Directors of the Buffalo Fire Appliance Corp., manufacturers of all types of fire extinguishers, has recently announced the resignation of Mr. Charles H. Stephens from the Presidency of the Corporation. Mr. Stephens will continue to be an active member of the Board of Directors.

Effective the first of the year, Mr. William M. Wetzel was elected as the new president. He has been Chairman of the Board. Mr. W. E. Tromanhauser is Vice President and active operating head of the company, assisted by Mr. T. G. Metz. In addition to the Buffalo Fire Appliance Corporation's standard line of fire extinguishers and its new line of stainless steel extinguishers, the company is engaged in the development of several new projects in the fire fighting field.

industrial Hygiene

ASSOCIATE EDITOR
JACOB A. GOLDBERG, A.M., Ph.D.

SOLVENT SAFETY MUST BE TAUGHT

WHILE the management or operator of a plant may provide all the mechanical safeguards and medical controls thus far developed to protect workers from the potential hazards of solvents, in the final analysis the safety of a worker depends upon his own cooperation, based upon an understanding of the reasons for the controls and his part in making them effective. Education towards this objective should be considered as much a part of the man's training as the proper use of his tools and equipment, warns the Safety Research Institute.

The New Worker

When a new worker is introduced to his job, his supervisor should discuss with him the solvents used, why they are used, the nature of the hazards they present, the safeguards provided to protect the employees from these hazards, and what the worker himself must do to avoid danger. Gas masks or supplied-air respirators should be tried on and he should be given an opportunity to handle and operate the various types of fire extinguishers. He can also be given printed literature to read at his convenience or to take home, if he wishes.

At intervals, perhaps two or three times a year, "refresher" meetings should be held at which all who have occasion to work with solvents at any time will be present. The plant safety engineer or whoever has the responsibility for plant safety can give a short talk on the subject of solvents and their proper use, followed by a question and answer period. If possible, a drill on the use of gas masks, fire extinguishers, and any other protective equipment provided for the men, should be held in conjunction with this meeting.

If an internal house organ is published, articles on the safe use of solvents and on gas masks, fire extinguishers, etc., can be included. These can be signed by the safety engineer, if there is one.

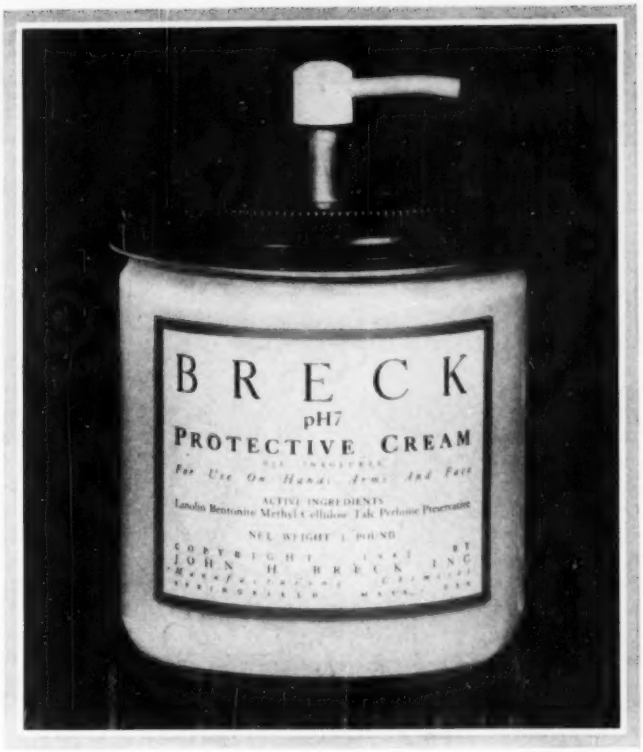
Use Posters

Posters on the bulletin board and placards in solvent storage and issue rooms may also be used as reminders, but these should be changed frequently.

If the number of employees who use solvents is large enough, it may be desirable to produce a set of slides for showing at meetings.

In the very large plant, it may be possible to prepare material such as leaflets, posters, etc., in terms of the specific processes and operations employing solvents in the particular plant. For smaller plants, much of the material already available will serve the purpose. Sources are the U. S. Department of Labor, state and municipal industrial hygiene services, the National Safety Council, the National Fire Protection Association, insurance companies and, often, the manufacturers of the solvents and of safety equipment.

Find Out About New Products in the Safety Field
See pages 68–71
Use the Coupon on page 71



BRECK

BRECK pH7 PROTECTIVE CREAM GUARDS AGAINST HARSH INDUSTRIAL MATERIALS

Skin irritations caused by working with industrial materials can be prevented with adequate skin protection. Breck pH7 Protective Cream spread onto the skin of the hands, face or arms will form a protective film that helps prevent direct contact with many harsh industrial materials. People working with cooling lubricants, cutting compounds, lime, paint, rubber dust and petroleum solvents will find that these materials are easier to remove after using Breck pH7 Protective Cream. The new dispenser top for the pound jar of Breck pH7 Protective Cream makes application easier, more sanitary, and saves the worker time.

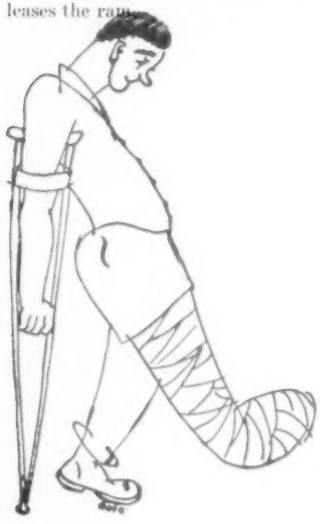
Request the new dispenser top with your next order of the pound size Breck pH7 Protective Cream.

JOHN H BRECK INC · MANUFACTURING CHEMISTS · SPRINGFIELD 1 MASSACHUSETTS
NEW YORK · SAN FRANCISCO · OTTAWA CANADA

LEARNING THE

PRESS INJURIES

SERIOUS accidents have resulted because power press operators tie down one of the switches so that the press can be operated with one hand. Instead of increasing their production or enabling them to operate the press with less effort, the ultimate result of this practice is that sooner or later the free hand gets into the press, and the operator finds that his production rate is zero while he nurses his injured hand—if he still has it. Such injuries, however, can be prevented by using electric switches as manual controls of the presses. To be certain that the operator's hands are not in the danger area during ram motion, the switches are connected in series. Both switches must be actuated at the same time in order to close the circuit to the solenoid or solenoid valve that releases the ram.



WELDER CAUSES FIRE

ONCE again, a welder learns about fire the hard way. This time he was cutting holes in the header tube of a transformer being assembled at an electrical plant. Transil oil had been drawn off below the header level but approximately four hundred gallons were left in the case. The header was plugged with asbestos, but apparently a spark from the torch ignited the oil. The fire was finally extinguished with carbon dioxide and water spray. Major repairs to internal parts were necessary.

When cutting or welding on any type of tank holding flammable liquids, safety requires that it be emptied of liquid and purged with an inert gas or flooded with water. Even tanks which have been "empty" for some time need purging, as they may contain flammable vapors.

RUBBER CEMENT FIRE

AN uninstructed new employee was sent to a storage building to fill a container with rubber cement. The building was a detached, unsprinklered, one story, brick plank on timber structure containing rubber cement in 50-gallon drums and flammable solvents in 5-gallon cans. The building had no lighting or ventilation. The new employee, being unfamiliar with storage arrangements, lighted a match to assist him and fire flashed over the entire area. Fortunately, he was not seriously burned, but the fire spread to all the stored solvents and rubber cement, resulting in great damage to the storage house before the fire was extinguished.

Rubber cement storage houses should be safely detached, noncombustible, and equipped with suitable automatic fire protection. They should have explosion relief venting and adequate ventilation. All electrical equipment should conform to the National Electrical Code for Hazardous Locations. Employees should be thoroughly instructed in safe handling methods, and signs should warn them of the fire hazard.

HARD WAY

AUTHORIZED PERSONNEL ONLY

THIS accident shows that many years of service does not entitle the employee to run equipment for which he is untrained. With 35 years of service in the same rubber plant, a calender service man attempted to move a jitney which was parked near an elevator shaft and which apparently was interfering with some of the material the man wanted to move. Instead of waiting for the truck operator, he started the jitney, ran through the wooden gate into the elevator shaft, and landed in the basement pit. The elevator was on the third floor and the jitney on the first. The jitney in falling turned completely over but did not fall on the man. However, he received multiple injuries including fractures of pelvis, vertebrae and shoulders. See that workers do not operate equipment they know nothing about.

ONLY A SCRATCH?

AN employee scraped his right middle finger on one of the paint containers he was loading onto a truck. Thinking the injury was of no importance, he did not seek first aid or report it. Several days later, his finger became infected and he developed a fever. Because one can never tell when a burr or some other minute fault may cause injury, it is advisable to wear some kind of hand protection during material handling operations. The employee's failure to seek medical attention for even a minor wound is inexcusable. All industries must continue to educate personnel in the importance of first aid and use posters to remind them.

REFINERY ACCIDENT

A REFINERY employee had emptied seven of the ten sacks of lime in a lime mixing tank which was filled with water to within two or three feet of the top. When dumping the next sack, the mixture splashed in his face, getting in both eyes. He was treated for cornea ulceration and chemical burns. This accident could have been prevented if the employee had worn his safety goggles and if he had only filled the tank half full of water before pouring lime into it.

HOT CHOCOLATE

THE overheating of cocoa processing equipment was the probable cause of a fire in a food plant. Alert employees shut down the unit and quickly extinguished the smouldering fire with a small hose. To prevent similar overheating and fires in the future, automatic temperature controllers and magnetic separators have been installed. More frequent cleaning should also keep the equipment in a safer condition.

Companions... FOR COMPLETE EYE PROTECTION

SAF-I-SHIELD

All Purpose Safety Goggle

Made of "Optilite"—lightweight, optically correct, strong, comfortable. Can be worn over prescription glasses — one size fits everyone. A goggle everyone will wear with pride.

SAF-I-SPEC

Smart Appearance — Instant Snap-On Temples

Made of "Optilite"—weigh less than one ounce. Temples clip on or off instantly—easily adjusted to fit any wearer's face. Tough—rugged—this is the spectacle safety men have been waiting for. LOW COST.

UNITED STATES SAFETY SERVICE CO.

KANSAS CITY 6, MO. • BRANCHES IN PRINCIPAL INDUSTRIAL CITIES

Air Pollution Meter

IN CASE you think counting the grains of sand at the seashore is impossible, science has unveiled an instrument that counts invisible particles in the air a million billion times smaller than a grain of sand.

The instrument doesn't even "pick 'em up and lay 'em down." It just looks at them, blinks an "eye" when they occur in the air being sampled by the instrument, and records the occurrence on paper.

The device was developed by Dr. Bernard Vonnegut, weather scientist in the General Electric Company's Research Laboratory at Schenectady, N. Y. It was described by him in a paper presented before the National Air Pollution Symposium, which met recently in Pasadena, Calif.

The work was done under Project Cirrus, joint weather research program of the U. S. Army Signal Corps, and the Office of Naval Research, in consultation with the G-E Research Laboratory. The device will be used by Dr. Vonnegut and other weather scientists to study the behavior of particles in the atmosphere, determine how they disperse, find out how far they travel, etc.

Such knowledge will be useful in developing atmosphere-seeding techniques for a material called silver iodide, which in similar small particle form causes supercooled or below-freezing moisture to turn to snow.

Useful for Smoke Studies

The device also should prove useful in air pollution studies to trace the development and dissipation of various smokes from industrial centers, and populated areas, according to Vonnegut.

Particles the instrument detects are less than a millionth of an inch in diameter, and by comparison, a grain of sand weighs approximately one million billion times more.

Particles are found in concentrations as low as 1,000 per cubic inch but have been noted as high as 10,000,000 per cubic inch.

In use thus far the instrument has detected high concentrations of particles in clouds five miles high, indicating that silver iodide particles could be similarly dispersed. High concentrations have been found in areas subject to smoke pollution, especially those down-wind from a city.

How the Instrument Works

As described in the paper, the instrument consists principally of a cloud chamber, through which a beam of light is directed, an air pump which compresses and

expands air three times a second in the cloud chamber, a moisture supply which introduces moisture into the chamber, and a light-sensitive photoelectric cell or electric eye which watches the beam of light.

Air to be tested for appearance of particles continuously passes through the cloud chamber. Three times per second the sudden expansion of this air causes condensation of moisture on any particles present, resulting in fog of various densities.

The amount of light scattering from the beam is in proportion to the number of fog drops formed, and any changes in the light scattering are detected by the electric light eye and transmitted as electric impulses to a recorder which automatically indicates the change graphically on paper. The number of particles is then determined by calibration.

Cutting Oil Sanitation

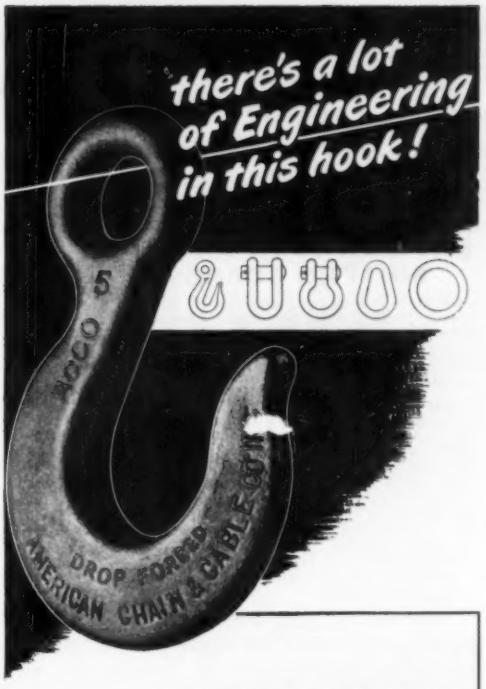
A RECENT issue of the "Industrial Health Bulletin," issued by the Canadian Dept. of National Health & Welfare, has summarized the problem of cutting oil and dermatitis. Many different formulations come under the heading of "cutting oils" but they can all be divided into two large groups—soluble and insoluble. The main purpose of soluble oils is to cool the cutting tool so that it does not lose its temper and break or chip. The secondary function is lubrication. Soluble oils are diluted copiously with water and allowed to flow over the cutting operations. They consist largely of sulfonated mineral and fatty oils. Small amounts of soaps and volatile materials are also ingredients.

Insoluble Oils

The insoluble cutting oils are used mainly as lubricants, aiding the tools in the cutting operation. The insoluble type of cutting oil consists principally of mineral oil with small amounts of fatty oil, sulfur and chlorine in the form of chlorinated hydrocarbons. The fatty oil content may be oleic acid, lard oil, fish oils or vegetable oils.

The insoluble lubricating oils are frequent producers of dermatitis—much more frequently than the coolant soluble oils. When using an insoluble cutting oil more actual exposure to oil occurs than in using the coolant form which contains only a small percentage of raw oil. All oils may plug the pores of the skin and form oil pimples but the petroleum oils which form the basis of the insoluble type have the additional property of defatting the skin.

Secondary infection at site of skin reaction may cause inflammation and boils. Usually such a dermatitis begins by the skin becoming irritated from chemicals in the oil. Then bacteria are carried by



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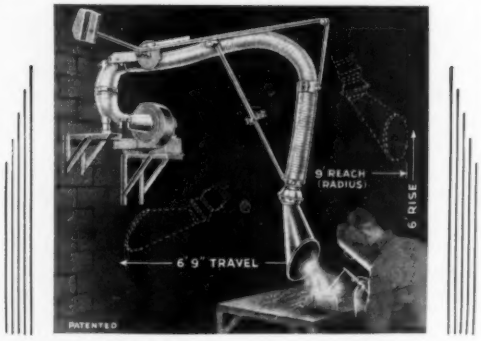

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dirt and grease into the openings about the hairs and the way is open for infection. Itching follows and causes scratching with bacteria-laden fingernails or rubbing with dirty hands, arms or clothing. As a result the skin may be broken, allowing germs to enter and infect the area. Papillomas may appear on hands, arms and other parts of the body. After cutting oils have been used a short time they contain many metal particles which may wound the skin. Waste also becomes impregnated with slivers of metal and if such waste is used for wiping oil from the hands, puncture wounds and cuts may occur.

Preventive Measures

Dermatitis can be prevented by avoiding contact with the irritating oil. This may be done by mechanical means such as the use of hoods, suction apparatus and other devices to prevent irritating substances from contaminating the skin or by personal protection such as protective clothing and ointments.

In the prevention of the usual type of dermatitis from cutting oils, personal hygiene is the primary factor. Clean, experienced workers who do not permit their clothes to become soaked with the spray of the oil and those who change clothes regularly are less likely to be affected. Blonde persons and those with dry skin are usually more susceptible to such outbreaks than dark skinned persons and must take extra precautions. Employees with a history of recurring skin rashes may be hypersensitive and may have to avoid further exposure.

In every establishment employing cutting oils it is important to furnish good washing facilities and cleaning materials that are adequate by modern standards.

Good, safe industrial cleaners are available and should be provided. A safe industrial cleanser should be freely soluble in hard or soft, cold or hot water. It should remove extraneous fats, oil and other soil without harming the skin or extracting the skin's natural fats and oils. It should not contain harsh abrasives nor irritant scrubbers.

Ointments and Clothing

If protective ointments are used they should be of a type which fill the pores of the skin with a non-irritating vegetable or animal fat. This barrier will help to prevent the entrance of the cutting oil.

Protective clothing will provide a valuable barrier against dermatitis from cutting oils. Designed for this purpose, there are on the market several reliable makes of protective clothing—gloves, sleeves, aprons, hoods and coveralls. Fabrics impermeable to chemicals are preferred for protective clothing because permeable materials offer protection only if frequently changed and cleaned. Rubber and oilcloth are excellent protectives as are synthetic resin filmed fabrics

which are resistant to the action of organic solvents. Finally, clothing must be comfortable. It must be sufficiently pliable to permit free movement, perforated in some portions to allow the evaporation of perspiration and neither so delicate that it will tear nor so strong that it will drag a worker's arm into a machine if caught in a moving part.

Where to Get Information on Solvents

SINCE improper handling of solvents may lead to fire or illness, it is important to be well informed about the liquids in use in the plant or shop, warns the Safety Research Institute. Information on the properties of the solvents employed and the safety of solvent-using processes may be obtained from a number of organizations and agencies.

The manufacturers are interested in preventing solvent accidents, and are therefore a major source of information on the properties and correct handling procedures for the chemicals they produce. In many cases, the solvent distributor can supply the necessary information, or can direct questions to the manufacturer concerned.

The Manufacturing Chemists' Association, to which solvent manufacturers belong, publishes detailed Safety Data Sheets on a great many products and these may be purchased from its Washington, D. C., office. The National Safety Council, which has its headquarters in Chicago, is another organization which publishes data sheets on the safe use of various solvents. The National Fire Protection Association, in Boston, Mass., publishes standards and other literature on the handling of flammable solvents.

There are also various governmental industrial hygiene agencies which can supply information on solvents and solvent processes. In addition, these agencies can supply various services, such as a check of the solvent process, a survey of ventilating equipment, examination of employees for symptoms of solvent exposure, and assistance in planning a safety program. In general, these services are available without charge.

Literature and data on health aspects may be obtained from the Industrial Hygiene Division of the U. S. Public Health Service, which has its headquarters in Washington, and also has District Offices throughout the country.

State agencies also publish literature and render the services described through State Bureaus of Industrial Hygiene. These are located in the State Department of Health, except in Massachusetts and New York, where they are part of the Labor Department. A number of cities have municipal hygiene departments which can render assistance.

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THE INDUSTRIAL Nurse

EDITOR

ROSAMOND J. WEBSTER, R.N., A.M., Ph.D.

The New Year

AVAILABLE information at the beginning of 1950 regarding the business prospects for the New Year are all keyed in a cheerful and hopeful mood. Despite evident setbacks, the same is true about the international picture. And, of particular concern to the readers of these columns, the health picture—lower morbidity, mortality, new therapies, advances in public health—are all on the favorable side. At the end of 1949 a new low figure was reached in the matter of mortality for a major segment of our population. Final figures are not as yet available, but the trend was all on the favorable side. Medical and sanitary sciences are advancing rapidly. Our standards of living continue to improve; education in preventive medicine, accident prevention, safety, nutrition and other related items are all on the positive side. The great contributions of selected industries in the further development of antibiotics, in advancing scientific research along many lines—all these spell out a cautious and yet a hopeful prospect for a successful year in conquering illness, prolonging life, and adding to enduring personal and national happiness.

When Facts Are Not Enough

IN THE area of science, facts are all important. In most matters relating to business affairs exact factual data are the determining factors in shaping policies. But in the area of human relations the facts alone, correct as they may be, are insufficient in determining policies or motivating the desired action. This applies with particular emphasis in the area of education, whether we are concerned with safety education, health education, or other educational problems. Drawing for once upon the international political situation for guidance, it is known that before World War II, Germany's educational system had the leadership of professional educators who were probably second to none in their scientific information. And yet, we have seen what a deplorable situation developed. The strident methodology, the philosophy of guidance from the top down, the inculcation of the absolute leadership principle, whether in national affairs or in educational practices, all these brought sorry results. American educators who knew Germany's educational system before 1940 and who have recently visited the country have indicated their belief that the educational techniques were excellent, but the philosophy, outlook, objectives, human relation factors must often be deplored. That is why so many difficulties have been encountered in the revamping of the educational system. Facts alone may often need a "breath of life" if they are to stimulate workers to a sense of responsibility to the industries in which they are employed, to the country as a whole, and to themselves. Some employers, however, need to be led along the same path.

The Arteries

THE great importance of diseases involving the arteries has been largely unrecognized by the public and by many physicians as well until recent years. This is the observation presented in an authoriative pamphlet on the subject published by the American Heart Association. Copies are available from the Association headquarters in New York and also from local associations in many parts of the country. These conditions, that is, diseases of the arteries, are responsible for more deaths in middle and older age groups than any other group of diseases. In addition, long periods of invalidism are often due to arterial disease. Encouraging results are now being reported in the treatment of these conditions. The many individuals heretofore regarded as crippled by certain arterial

diseases can now be restored to active life. In others, invalidism can be prevented by early recognition and skillful medical and surgical care. Arteriosclerosis, thrombo-angitis obliterans, and Raynaud's syndrome are the major conditions of concern. Pain, skin temperature changes, color changes in extremities, trophic changes, ulcers of the skin and extensive gangrene are major signs in the latter two conditions. Early recognition and reference to a plant or family physician can aid materially in such cases. Self-medication and lack of proper treatment by a physician can lead to serious consequences. The index of suspicion should be kept at a high level when the indicated signs and symptoms are observed or reported.

Interpersonal Factors

HUMAN relationships are the deciding factors in day-by-day living. They also influence the quality and quantity of production, the number of sales, the good will of commercial establishments. These interpersonal relationships play a particularly important part when it comes to physician-patient and nurse-patient interplay of personalities. It has been noted that some patients, when ill, regress in some degree to an infantile attitude. They place the attending physician in the position of a parent or nurse, from whom the utmost of care is demanded. On the other hand, such patients deem it amusing to trick or annoy the physician. The same applies to the attending nurse as well. The physician, as the person who assumes responsibility for the patient's cure, steps into a parental role, usually that of the father, and is unconsciously regarded as such by the patient. His feelings are ambivalent. The physician is regarded with admiration, trust and affection as a good father who will heal him. On the other hand, he is looked upon with fear and hatred, as a bad and punitive father. The feeling of such patients for the nurse is usually akin to that felt for a mother and sister, and varies a good deal between male and female patients. Women are apt to be more critical, demanding and resentful of nurses' authority, though some men transfer their resentment against domineering mothers to nurses. These several points of view may not fully apply in the usual first-aid room. Still, they are deserving of consideration. An understanding of emotional factors may help considerably in the day-by-day activities of a busy industrial nurse.

The Glands and Health

THE science of endocrinology has made rapid progress in the last two decades. How much more remains to be accomplished in this area affecting the health of man is dramatically evidenced by the recent reports regarding Cortison, which is derived from the

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adrenals, and ACTH from the pituitary gland. Both have been reported as being used experimentally in the treatment of arthritis, rheumatism, and other conditions. The medical director of nationally known industrial laboratories concerned with this research reports that, in his opinion, the largest area of medicine that has been opened up since the discovery of bacteria relates to the partial delineation of the adrenal-pituitary function. Some other important facts have come to light. The question of reaction to stress is of particular interest, in so far as lawfully employed persons are concerned. Thus it has been reported that the person with adrenal glands that can adequately react to various types of stresses, such as trauma, infection or environmental stresses, remains well, whereas the person with malfunctioning adrenals comes down with any one or more of a variety of diseases. This tie-in between industrial laboratories and the medical research institutions is indeed bringing a greater understanding in this and other important areas. Penicillin is an excellent example of what industrial research and production have accomplished. We are apparently on the brink of other findings of inestimable value for the health and welfare of our country.

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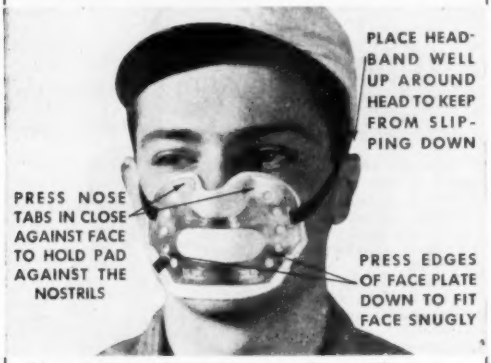
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Psychiatric Trauma & Obesity

IT HAS long been known that there is an intimate relation between the prevailing mood of an individual and the nutritional state of the body. In World War II it was reported that much loss of weight was combined with neurasthenic, anxious or depressive symptoms. The relationship could be two fold—a severe state of emotional tension might bring about rapid loss of weight despite normal food intake; and a previously stable individual might become susceptible to anxieties and fears only after the onset of exhaustion caused by extreme physical exertion and loss of sleep. Depletion of vitamin reserves might contribute materially to the resulting mental upset. Causes of rapid increase in weight have also been reported following psychologically traumatic experiences, such as severe accidents. Much of the increase in weight in such cases can be attributed to water retention. Fat accumulation extending over a period of weeks or longer might also follow. These physical manifestations following psychiatric trauma are evidence of the need for careful study and observation of complaining individuals who come to the attention of the industrial nurse. The effect of physical trauma in causing mental reactions, and in turn varied physical manifestations, needs to be given consideration. A cheery word is not enough therapeutically for deep-seated complaints that are not easily explained. Professional skills beyond those of the industrial nurse may have to be called upon before the causes may be defined and a form of therapy outlined.

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FIRST AID AND MEDICAL

Resuscitation Methods 1
J. H. Emerson Co. Two bulletins are available on resuscitation. The first is a one-page bulletin describing the new manual method of artificial respiration by lifting the hips. The second is a 4-page folder, "Medical References on Resuscitation." Important studies are listed under four general headings: Safety, Effectiveness, Pressures, and Effect on Circulation. This bibliography is a valuable guide to first aid workers seeking background information.

Antihistaminics and the Common Cold 2
Anahist Co., Inc. A 12-page background report on the use of antihistaminics for the treatment and prevention of the common cold. The booklet outlines the theory behind the use of antihistaminics, the problem of eliminating adverse side effects, and the results of various controlled tests of the drug for the prevention and treatment of colds. The drug recommended by the report is stated to be the least toxic of the antihistaminics. The report also includes a bibliography of published work on the subject.

FIRE PREVENTION

Fireproofing Cement 3
The Eagle-Picher Co. An 8-page brochure describing the U.L.-approved cement for fireproofing structural steel columns, supporting members, equipment bases and tower supports. The trowel-applied cement sets in 24 hours, is lightweight and paintable, and resists corrosion. Pictures show clearly how to apply the cement, and charts give the results of fire tests and other technical data.

Safety Tanks for Vehicles 4
American Safety Tank Co. A 4-page illustrated folder gives the highlights on these crash-resistant, spill-proof, non-explosive fuel tanks for vehicles. The folder points out that the tanks are approved by Underwriters' Laboratories and that they are available in various sizes with various mountings.

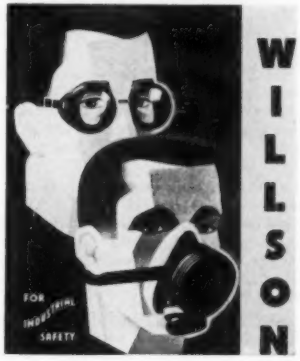
PERSONAL PROTECTION

Safety Shoes 5
Hy-Test Div., International Shoe Co. "Wear Safety Shoes That Are Built for Your Job!" is the title of a large one-page bulletin which illustrates and describes the nine new styles of safety shoes being added to the company's line for 1950. An attached memorandum also gives prices and pertinent facts about ordering.

Cartridge Respirators 6
American Optical Co. A 6-page folder describes and illustrates this company's completely new R5000 line of twin cartridge respirators. The new facepiece unit offers increased visibility, a flexible fitting brace for a closer, more comfortable fit, and new part and valve design. The folder has a chart showing the appropriate chemical cartridges and filters to be used with the facepiece for protection against all dusts, organic vapors, acid gases, acid & organic gases, ammonia, organic vapors & all dusts, and metal fumes.

Nuisance Dust Respirators 7
The Goggle Parts Co., Inc. A 4-page illustrated folder gives full details on the new FLEX-A-FOAM filter mask for non-toxic nuisance dusts. The bulletin features the lightweight, snug fit, filtering efficiency and breathing comfort of these dust masks, and shows how they may be used in industry, on the farm, and at home.

Industrial & Acid Gloves 8
B. F. Goodrich Co. A new 4-page catalog section describes and illustrates various types of industrial and acid rubber gloves. Specifications and uses are outlined for acid-resistant and oil-resistant types available in heavy gauge, light gauge, and with roughened surfaces to prevent slippage; similar gauntlet gloves with straight or curved fingers; and coated canvas gloves with knit-wrists or gauntlets for protection against abrasion, acids, chemicals, oils and other irritants.



Safety Equipment Catalog 9
Willson Products, Inc. In addition to information on the company's line of eye and respiratory equipment, this new 64-page catalog offers a fund of technical and reference material to help the user select the best type and style of equipment for specific industrial hazards. Pictures and charts add to the clarity of the exposition. Included are discussions of 1. U.S. Federal Specifications for heat-treated glass and tests for conformance, 2. advantages and proper use of plastics in the safety field, 3. types of filter glass for various degrees of glare and radiant energy, 4. respiratory hazards, suitable respirators for them, and how to care for respirators, 5. gas mask selection for various gas and vapor hazards.

EDUCATIONAL AIDS

Safety Awards & Trophies 10
United Insignia Co. A complete 50-page catalog showing all types of awards which can be applied to safety contests and programs. All items are illustrated and prices are given. The contents include trophy cups, statuettes, plaques, emblems, ash tray and other gift awards, charms, medals, pins, etc. Here is a full list of awards for recognition of the safe worker and to encourage others to greater safety effort.

MATERIAL HANDLING EQUIPMENT

Safety Hook 11
The Brewer-Titchner Corp. A 2-page bulletin shows the company's drop-forged safety hook for use on cranes, derricks and other material handling equipment. One safety feature is the automatic mousing which engages or disengages as the load is applied or released. It gives positive protection against the load's slipping from the hook. The bulletin gives complete specifications for both the 5-ton series and 10-ton series of hooks.

Fork Trucks & Tractors 12
Clark Equipment Co. A new 8-page general catalog covering the full line of Clark gasoline- and electric-powered fork-lift trucks and towing tractors. All the pertinent facts necessary to a preliminary consideration of materials handling machines are shown by means of drawings and charts. Data has been arranged to make comparisons between various models as simple as possible. Also shown are special attachments and devices, such as a paper scoop, ram, clamp-lift, shovel, brick fork, rotating fork, pusher, etc.

Rolling Scaffolds 13
Patent Scaffolding Co. How to put workers at job level safely is the subject of a New 4-page bulletin on "Trouble-Saver" sectional steel rolling scaffolds. It describes and illustrates various arrangements of prefabricated steel sections in use as movable scaffolds for repairing, painting, plastering and other maintenance work. Methods of adapting the units to space, height and shape requirements are shown. Text covers erection advantages and safety features.

ELECTRICAL EQUIPMENT

Switches 14
Microswitch Co. A 2-page bulletin outlines the construction and uses of several types of electric switches for industrial purposes. It includes descriptions and pictures of hermetically sealed units which are vapor-proof, an explosion-proof type for aircraft, oil-proof industrial switches, and a unit with a torque of 0.14 ounce-inch. Details are also given on the positive lock roller arm of MICRO precision switches.

Fluorescent Lamp Guards 15
Webster Electrical Co. A one-page bulletin which describes three types of lamp locks to prevent fluorescent lamps from falling from open fixtures. The three types are for fixtures with some space behind the lampholders, fixtures with very little space, and fixtures with lampholders mounted back to back.

Automatic Emergency Lights 16
Electric Cord Co. "Light Failure Is No Laughing Matter" is the title of a 4-page bulletin which offers the Minuteman emergency lighting units as a means of providing instantaneous and automatic lighting for stores, plants, theaters, utilities, hospitals, railroads, terminals, offices, etc. The battery operated unit has two floodlights and can be plugged into any 115 v A.C. outlet. The batteries are charged automatically. Approved by U.L.

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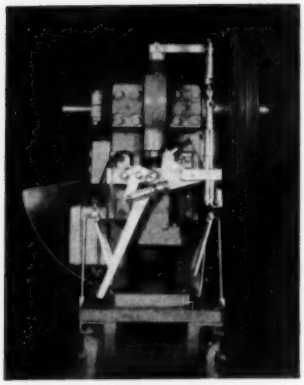
TO SERVICE DEPT., SAFETY ENGINEERING MAGAZINE



NEW PRESS GUARD

CONTINUING research in the prevention of accidents to power press operators has resulted in the new Anderson guard, manufactured by the Jamestown Safety Guard Corp. of Jamestown, N. Y. This safety guard combines the features of a gate guard and a sweep guard, plus guard-synchronized control of the ram. When the foot pedal is depressed, the guard-arm sweeps across the front of the press, removing the operator's hands from the danger zone, while the plastic shield which is attached to the arm acts as a barrier to prevent the operator from putting his hands into the die area. When the guard is closed, the press is automatically tripped, and it remains closed until the dies have reopened.

In case of a repeat, clutch or other mechanical failure, the Anderson guard is ram-operated so that hands are removed from the die space before the ram has completed one-half of its down stroke. If the guard is removed for set-ups, adjustment or any other reason, the power to the press is automatically shut off.

Although designed particularly for secondary or hand-in-the-die operations, the Anderson guard can also be used as a primary guard, forming a stationary barrier when feeding strip or sheet, or with spout or dial feeds. These safety guards are available for presses with strokes of from 1" to 6" inclusive. For complete details, send in the coupon.

HYDRA-LIZER FOR LADDERS

A HYDRAULIC ladder attachment that automatically corrects unlevel ground conditions and provides maximum safety for ladder users is announced by the Anderson Products Co., of California.

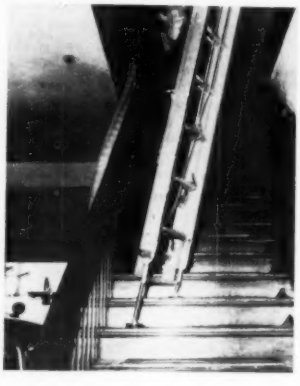
Inter-connected hydraulic units displace oil from one leg into the other as ladders are erected to correct differences in terrain from hillsides to stairways. By moving a foot operated valve lever the ladder can be instantly locked in any position desired.

The "Hydra-lizer" has undergone two years research and testing with Southern California public utilities, fire departments, painters, electricians and maintenance men and now is being adopted as standard equipment.

The unit is unique as it is designed to be easily attached to all types of ladders, wood or metal, straight or flared base. Telescopic steel tubing automatically adjusts to the proper width and the unit can be reused on ladders of different dimension.

The "Hydra-lizer" is designed to meet the industrial ladder users need of a strong, lightweight, automatic ladder equalizer to be able to operate under all conditions and stand abuse. A ball and socket shoe to conform to all irregularities of terrain along with its ability to be instantly flipped up on end for ice, slippery asphalt and soft ground conditions make a combination of all the best features of ladder shoes.

The "Hydra-lizer" is constructed entirely of steel for working loads of over five hundred pounds and yet weighs only six pounds. It was devised and perfected by a sign painter, Ralph J. Anderson. For further details send in the coupon.

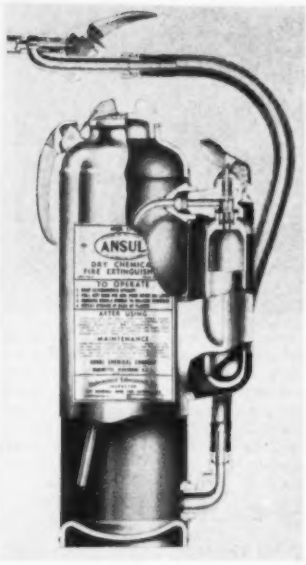


GUNK IN QUARTS

BORN of a depression year (1932) The Curran Corporation announces that deliveries have begun of the famous GUNK, Self-Emulsifying and Self-Scouring Solvent cleaner in a new quart size, three-color lithographed can especially designed for over-the-counter sale.

The Laboratory defines GUNK as a versatile, diphase solvent that cleans stubborn oil stains from the two car garage floor—instantly removes road, oil and tar from white side wall tires and shines chromium grillwork without rubbing. A favorite at the aerodrome, GUNK launders oil soaked fabric and degreases engines. At the mariners, GUNK safely cleans engine compartment and bilge and, according to the development laboratory, GUNK shampoos paint brushes after use so that bristles remain soft and pliable for indefinite storage. Please send in the coupon for further information.

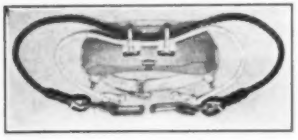
USE THE CONVENIENT COUPON ON PAGE 71



NEW DRY CHEMICAL EXTINGUISHER

AN IMPROVED model dry chemical extinguisher, said to be completely water-tight, has just been introduced by Ansul Chemical Company, Marinette, Wis. The company reports the improved unit, the Ansul Model B Extinguisher, is more rugged, more dependable and easier to maintain than its predecessor, the Ansul Model A Extinguisher, and incorporates 12 new design features. Chief among these are the nozzle and cartridge receiver. Specially designed seals inside the nozzle and receiver have made these two vital parts water-tight.

Other important changes in the Model B Extinguisher are new threaded hose connections, new cartridge guard finger grip and redesigned carrying handle. Performance has been improved by these engineering advancements, and maintenance and recharging have been simplified. It is available in 20 and 30 lb. sizes. For complete details, send in the coupon.



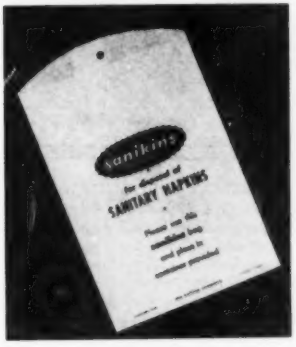
SHOCK ABSORBER BELTS

THE new SAFE-HI shock absorber Window Cleaners' Belt made by the Rose Mfg. Co. of Denver has been released for sale after extensive research and testing. Most fatal on-the-job falls among window cleaners occur when only one belt terminal is fastened to the building anchor. A fall against only one terminal is a free fall the total length of the belt, and an ordinary safety belt which stops a man with a jerk at the end of his free fall frequently will pull out or break the building anchor.

SAFE-HI shock absorber belts employ a new material of the Nylon family called Unolyn, which has the unique ability to elongate to several times its original length. This elongation, without rebound, spreads the shock of deceleration and allows only minimum stress on the wearer, building anchor and all belt parts.

Built to rigid standards of safety engineering, these new shock absorber belts offer the following points of advantage: 1. Nylon service rope and Unolyn safety rope are completely separate, 2. Service rope takes all the wear because safety rope is permanently longer than service rope at maximum adjustment, 3. All fastenings requiring strength are stitched, not riveted, 4. Single pass, non-slip buckle, 5. Choice of wide comfortable back pad or 4" web inside waist belt, 6. Light alloy rope eyes enclose waist belt as well as the two ropes.

For complete details, check the coupon.

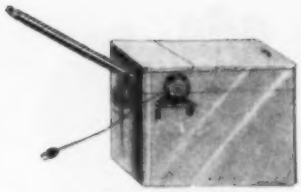


SANIKINS

MAINTENANCE departments and others responsible for keeping the public washrooms clean and neat will be interested in learning that SANIKINS BAGS, are being offered to the trade. These SANIKINS BAGS are high quality paper bags with the copy "For Disposal Of Sanitary Napkins. Please use this SANIKINS bag and place in container provided." Thus they are a big aid in promoting public cleanliness, and personal hygiene. They are a big help in stopping the cause of high plumbing bills in washrooms. Samples and prices can be obtained by sending in the coupon.

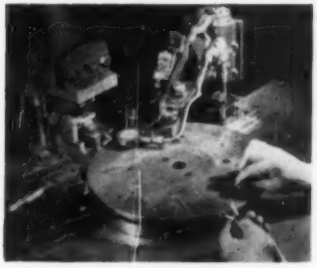
FLUORESCENT LAMP DISPOSAL UNIT

THE safe disposal of burned-out fluorescent lamps has always been a problem. The large amount of glass involved and the awkward shape have made it difficult to handle these lamps without injury from flying and broken glass. More recently, the toxic nature of the beryllium used in these lamps has been pointed out



and the need for safe disposal methods is well recognized to prevent poisoning. The Laduby Company of New Haven has developed the Flur-o-lamp Disposal unit which grinds the lamps to tiny pieces safely, quickly and economically.

The advantage of this unit is that the grinding process is carried on under water. This method completely prevents beryllium dust from contaminating the air. Capable of disposing of 100 lamps in ten minutes, the unit operates on about 12 gallons of water and a 110-volt electrical circuit. Refuse from the unit can be carried away in a bucket. Taking up less than two square feet of space, the Laduby Flur-o-lamp Disposal is indispensable for factories, office buildings, public buildings and similar places where large quantities of fluorescent lamps are used. For complete details, send in the coupon.



AUTOMATIC PRESS FEED

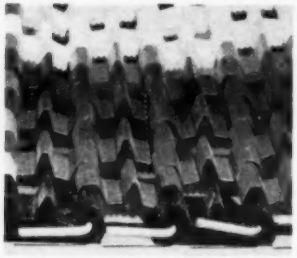
AN AUTOMATIC feed for punch presses and other machine tools is offered by The V & O Press Company of Hudson, N. Y. Called the V & O Feed-O-Matic, it is designed to eliminate injury to press operators by completely removing the need to place one's hands in the danger zone. The device transfers a part from a nesting plate and places it in a standard punch press die by means of a mechanical hand or vacuum pickup. As the mechanical hand returns for the next piece, it automatically trips the press and the finished part is ejected from the die. The operator's hand is never under the punch or at a point of danger.

The mechanical hand positions the blanks accurately in the die—with resulting longer die life. The removing arm has a micro-switch safety feature, preventing tripping of the press unless the blank is correctly placed.

The Feed-O-Matic is built in six sizes and can be attached to any make of press. It is also adapted for placing pieces into position for machine tool operations. For complete details, send in the coupon.

MOLDED WORK GLOVES

SOMETHING new has been added to the popular Edmont Neox-coated Work Glove—the glove which, its makers claim, regularly outwears 3 to 9 pairs of ordinary work gloves on actual job tests. Now, fingers and thumbs of these oil, chemical, cutting and abrasion resistant work gloves are being molded to the natural position and curvature of the thumb as well as fingers and with a much wider span between thumb and first finger. These design improvements are said to give the wearer greater comfort and firmer, surer grip, reducing hand fatigue. Safer and more efficient work handling are direct results. Neox-coated work gloves are available in knit-wrist as well as the gauntlet style illustrated. Send in the coupon for complete information.



PLASTIC LINK MAT

A NEW type of floor mat combining many advantages has just been announced by the American Mat Corporation of Toledo. To be marketed under the trade name of Evertred, this new mat, constructed of vinyl plastic links woven on a rust-resisting spring steel wire network, has almost unlimited applications.

Evertred affords safety underfoot through the special design of the links. One side of each link is slightly corrugated to effect a non-slip surface even when the mat is used in shower rooms and pools, in which cases it is comfortable to walk on even with bare feet. An additional safety factor is provided in the non-trip beveled nosing.

The other side of the links is ridged to afford a mat surface that effects unusually good dirt removal. The mat will not absorb soil, discolor with use or age, nor lose any of its color brilliancy, and is easy to keep clean the makers state. Non-porous and non-absorbent, Evertred is greaseproof and can be used even where oily conditions would ordinarily quickly destroy rubber mats.

Available with links in any of five brilliant colors—green, red, brown, white and black—a distinctively beautiful Evertred mat can be had in any desired pattern. Since the brilliant colors are fade-proof, this mat should meet with quick acceptance for use in building entrances.

Evertred mats are available in any width up to five feet and in any desired length. Smaller sizes are also being produced for home use.

For complete details, send in the coupon.

FLUORESCENT MAGNIFIER

INDUSTRIAL PRODUCTS CO. of Philadelphia announces two new industrial magnifiers equipped with fluorescent lighting and designed for assembly workers, inspectors, toolmakers, machinists, and others engaged in close work. The unit floodlights the work area with scientifically focussed, shadow-free fluorescent light, magnifying the work through a high quality 5" diameter lens.

The bench type of magnifier, illustrated here, has a steel base, two adjustable friction arms, and two swivels (one at base and one at top of lens frame) permitting adjustment to any desired position. The portable type is similar to the bench model, but is fitted with a hardwood handle in place of the arms and base. This second type is for use inside of machines and in other out-of-the-way places.

The magnifiers are furnished complete with six feet of rubber cord and ballast plug, ready for use in any 110-120 volt, 60 cycle circuit. For further information, send in the convenient coupon.

LIGHTWEIGHT TOTE BOXES

GOOD plant maintenance is an important contributory factor in accident prevention, it is pointed out by the Convoy Co. Inc. of Ohio, manufacturers of a new line of tote boxes. Use of these boxes on production line and for permanent storage eliminate hazards caused by objects carelessly scattered around the plant.

These tote boxes are made in hundreds of sizes and shapes to meet job requirements. They are tapered and nest together to save space when not in use. Made of Chem-Board, a chemical impregnation process, they are hardened, strong and rigid yet light in weight. Chem-Board is water resistant and is not injured by cutting oils or carbon tetrachloride.

EMERGENCY BEACON

THE Thoroflare Emergency Beacon is a new dependable flashing light for emergency use, made by the Emarco Corp. of Dayton. The unit will give at least one hundred hours of continuous operation from a single inexpensive standard six volt lantern battery, and operates over a wide range of temperature from 20 degrees below zero (fahrenheit) to normal summer temperatures. The brilliancy of the flash is maintained throughout the life of the battery. Operation is entirely automatic and instantaneous.

The case is constructed from steel and sealed with a gasket to provide watertightness. A lighthouse type fresnel lens is employed to spread the light beam in a three hundred and sixty degree pattern. All models employ the watertight case with the exception of the Model A. The Thoroflare Beacon can be quickly serviced without the aid of tools.

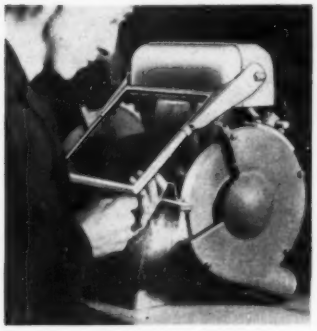
Thoroflare Lights are available in single units or in kits of three. The kits of three are provided with a carrier rack which can be mounted in a convenient location by the use of two standard machine screws. Colors of light in red, blue, green, white and amber are available as standard equipment. Many different models are made for special purposes such as the hauling of poles, watchman's

lantern, ladder units, for the protection of aerial ladders, permanent mountings for use on tool trucks or the rear of a vehicle, marine units in polished brass case for emergency use on boats.

The Thoroflare Emergency Beacon is approved by the Underwriters Laboratories and is listed under their re-examination service. It is certified to meet the requirements of the I.C.C.

The Emarco Corporation of Dayton are the manufacturers and they have advised that present users include many Government agencies, utility companies, sheriffs offices, police departments, fire departments, sanitation departments, transportation companies, oil companies, tankers, pleasure craft, airports (for obstructions) and many others.

Please use the coupon for further details.



ELECTRO-LOCK SHIELD

A NEW Electro-Lock Safety Shield has been developed by the Junkin Safety Appliance Company, Inc., of Louisville, Kentucky. The new Shield has been developed to protect the man who "forgets" his goggles. It is both an illuminating safety shield and a machine control. As a safety shield it will permit the operator to see clearly the work he is performing and at the same time protect his eyes and face from the danger and discomfort of sparks, flying chips, and emery dust. As a machine control it will not permit the grinder to be started when the movable shatter-proof glass safety shield is not in a completely protective position. The Electro-Lock Shield demands that the operator work safely or not at all.

Several unique features are incorporated in the design. Convex "bulls-eye" lenses focus the shield's lights directly on the point of operation. Mercury switches control both electrical circuits to the shield's two lights and to the starting switch. Movement of the shatter-proof shield allows it to be placed in the exact and best position for the individual operator. Shields are available for both 110 and 220 volt circuits.

The Electro-Lock Shield once installed becomes an integral part of the grinder and must be down in a completely protective position before the operator can start his work. Thus the Electro-Lock Shield provides the essential necessary for all proper guarding—the elimination of the human element. Send in the coupon.

NEO-CORK SOLES

THE Gro-Cord Rubber Company, of Lima, Ohio, announces their new Neo-Cork sole. This sole is the result of popular demand by shoe manufacturers and long, careful research and development. Neo-Cork is the successful combining of DuPont Neoprene and cork, creating an industrial sole that is oil resistant, shock absorbant, slip resistant, and insulates the feet against heat and cold. Neo-Cork soles are available in either brown or black.

FLASH-O-GRAPH

SAFETY messages which gain and hold attention by a combination of light and motion are made possible by the new M.S.A. Flash-O-Graph, a product of Mine Safety Appliances Company of Pittsburgh.

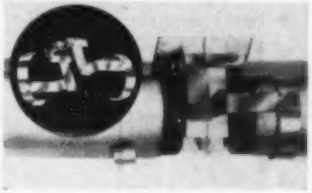
Messages on an M.S.A. Flash-O-Graph are spelled out in bright dots of light which move along continuously like electric news bulletins. The Flash-O-Graph is a powerful aid to safety in plants and offices, is economical, dependable, and easy to maintain, says the manufacturer.

The message flasher is cased in steel with a black crackle finish. It measures 23" x 3" x 6" and weighs 6½ lbs. complete. The flashing action is provided by a replacable, endless, perforated tape which is illuminated by a fluorescent lamp. The tape passes continuously behind a glass window through which the message is projected. Fifty-two standard tape messages are available and special messages can be furnished on request. For complete details, send in the coupon.

BURN OINTMENT

A REMARKABLE new first aid jelly ointment for burns is now available in a two-tube unit carton to fit the "D-Carton Interchangeable Unit System of First Aid" offered by the Davis Emergency Equipment Company, Inc. of Newark, N. J. This new pain killing, antiseptic burn treatment ointment, Americaine, was designed to overcome the problem of a painlessly removable, water soluble jelly ointment, and to provide in addition the extremely desirable features of antisepsis, local anesthesia, and air exclusion.

Benzocaine, widely used in medicine and dentistry for local anesthesia, provides the pain killing properties and acts quickly to deaden pain over a relatively long period of time. Antisepsis is effected by the presence of oxyquinoline benzoate —10 times more powerful than phenol against pus-producing organisms. Other recommended uses in addition to burn treatment are: Skin irritations, insect bites, poison ivy, and cresote burns. For complete details, send in the coupon.



FLUORESCENT LAMP GUARD

NEWSPAPERS and magazines have recently carried stories about the danger of poisoning from the ingredients contained in fluorescent lamps. A new safety device that affords positive, permanent protection against the hazard of falling fluorescent lamps in continuous run, end-to-end lighting installations is now available. These Den-El Safety Fluorescent Lamp guards are made of specially treated resilient steel which makes it possible for them to be sprung aside for relamping and cleaning. Quickly and permanently installed with a screwdriver. These guards prevent injury, poisoning, work interruption, loss of time, contamination of food in process, spoilage of material and damage to machinery. There is a guard for almost every type of installation. For complete details concerning the Den-El Safety Guard, send in the coupon.

February, 1950

To SAFETY ENGINEERING

75 Fulton St., New York 7, N. Y.

For prices and complete details of items mentioned in this month's "What's New in Safety Products," check items that interest you and mail coupon.

- ☐ New Press Guard
- ☐ Hydra-lizer for Ladders
- ☐ Gunk in Quarts
- ☐ Dry Chemical Extinguisher
- ☐ Shock Absorber Belts
- ☐ Sanikins
- ☐ Fluorescent Lamp Disposal
- ☐ Automatic Press Feed
- ☐ Molded Work Gloves
- ☐ Plastic Link Mat
- ☐ Fluorescent Magnifier
- ☐ Lightweight Tote Boxes
- ☐ Emergency Beacon
- ☐ Electro-Lock Shield
- ☐ Neo-Cork Soles
- ☐ Flash-O-Graph
- ☐ Burn Ointment
- ☐ Fluorescent Lamp Guard

Firm Name .....

Attention of .....

Position .....

Firm Address .....

City .....

If You're Looking For:

- SAFETY BELTS
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- PRESS GUARDS
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- EDUCATIONAL AIDS
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- EYE PROTECTION
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- FIRST AID
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BEST'S SAFETY DIRECTORY

Index to Advertisers and their Agencies

American Chain Division, American Chain & Cable Co.	61	Reincke, Meyer & Finn, Inc., Chicago
American Chain & Cable Co.	5	Reincke, Meyer & Finn, Inc., Chicago
American Mat Corp.	51	Wendt Advertising Agency, Toledo
American Optical Co.	Inside Front Cover	Sutherland-Abbott, Inc., Boston
American Safety Tank Co.	39	Potts-Calkin & Holden, Inc., Kansas City
Ansul Chemical Co.	11	J. A. Cormack Advertising, Milwaukee
Breck, John H., Inc.	57	Charles Sheldon, Springfield
Cambridge Rubber Co.	29	J. M. Reilly Co., Boston
Carbisulphoil Co.	66	Tracy-Locke Co., Inc., Dallas
Chic Maid Hat Mfg. Co., Inc.	46	Armand S. Weill Co., Inc., Buffalo
Chicago Eye Shield Co.	Inside Back Cover	Reincke, Meyer & Finn, Inc., Chicago
Cover, H. S.	37	Jerry Bryant Advertising Agency, Chicago
Davenport, A. C., & Son, Inc.	62	Turner Advertising Agency, Chicago
Dayton Safety Ladder Co., The	47	Strauchen McKim Advertising, Cincinnati
Dionol Pharmacal Co.	50	Root-Mandabach Advertising Agency, Chicago
Dolge, C. B., Co.	65	The Caples Co., N. Y.
Faulk, F. R.	52	
General Detroit Corp.	6	Holden, Clifford, Flint, Inc., Detroit
Goggles Part Co.	43	Carr Liggetts Advertising Agency, Cleveland
Gro-Cord Rubber Co.	9	Whipple & Black, Detroit
Hillyard Sales Cos.	63	Phillips, Reick & Fardon, Kansas City
Hood Rubber Co.	55	Henry A. Loudon Advertising Inc., Boston
Hooper, Wm. E., & Sons	10	Walter S. Chittick Co., Philadelphia
Hy-Test Div. of International Shoe Co.	3	Westheimer & Block, St. Louis
Hynson, Westcott & Dunning, Inc.	Back Cover	
Junkin Safety Appliance Co.	44	Farson & Huff, Advertising, Louisville
Lehigh Safety Shoe Co.	14	Frederick-Clinton Co., New York
Marsh & McLennan, Inc.	49	Doremus & Co., Inc., Chicago
Martindale Electric Co.	66	Kenneth H. Kolpien, Cleveland
Metal Arts Co., Inc.	54	Hutchins Advertising Co., Inc., Rochester
Milburn Co.	33	St. Clair Advertising Agency, Detroit
Mine Safety Appliances Co.	1	Walker & Downing, Pittsburgh
Onox Inc.	41	W. B. Garthwaite Advertising, San Francisco
Quabaug Rubber Co.	7	
Reece Wooden Sole Shoe Co.	53	
Rose Mfg. Co.	35	Gray & Co., Denver
Ruemelin Mfg. Co.	62	Paulson-Gerlach Assoc., Milwaukee
Scott Aviation Corp.	65	Melvin F. Hall Advertising, Buffalo
Stonehouse Signs, Inc.	13	Walter DuBree Adv. Agcy., Los Angeles
Surety Rubber Co., The	45	
Surty Mfg. Co.	42	
Tamms Industries, Inc.	48	Frederick, Franz & Mac Cowan, Chicago
U. S. Safety Service Co.	60	Phillips, Reick & Fardon, Kansas City
Watchemoket Optical Co.	4	
West Disinfecting Co.	25	Bert Goldsmith, Inc., New York

● CESCO Super-Safety lenses are guaranteed to equal or exceed federal specifications for optical qualities and resistance to impact. In the laboratory, CESCO cup-type safety goggles withstand severe impact tests. On the job, hundreds of thousands of CESCO goggles have proved their strength and quality in use. You find them in plants where safety standards are the highest. Add comfort and durability as additional features of CESCO goggles and you conclude: **For Safety, use CESCO.** Available with clear or filter lenses. Write for catalog showing CESCO's full line of safety goggles.

CHICAGO EYE SHIELD COMPANY
2310 Warren Blvd. • Chicago 12, Ill.

CESCO spectacle-type goggles, with or without sideshields, feature the exclusive Comfort-Bridge.

FREE!...

Send your name on company letterhead for "Safety Notes"—CESCO's handy pocket memorandum.

CESCO

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TIME FOR *Thantis* LOZENGES

For throat irritations 'Thantis'* Lozenges provide effective relief. 'Thantis' Lozenges are especially beneficial in soothing these conditions because they are both antiseptic and anesthetic for mucous membranes of the throat and mouth. These effects are due to the two active medicinal agents, 'Merodicein'* an antiseptic of low toxicity, and Saligenin, a mild local anesthetic. When 'Thantis' Lozenges are dissolved in the mouth, the two ingredients dissolve slowly, providing prolonged medication of the throat.

Each lozenge contains 'Merodicein' (H. W. & D. brand of mono hydroxymercuridiiodoresorcinsulfonphthalein-sodium) 1/8 grain, Saligenin (orthohydroxybenzyl-alcohol, H. W. & D.) 1 grain.

Supplied in vials of 12 lozenges in individual cartons.

*Reg. U. S. Pat. Off.

HYNSON, WESTCOTT & DUNNING, INC.

BALTIMORE, MARYLAND